

A review of the genus *Bulbothrix* Hale: the species with medullary norstictic or protocetraric acids

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Academic editor: P. Divakar | Received 8 December 2011 | Accepted 13 February 2012 | Published 5 March 2012

Citation: Benatti MN (2012) A review of the genus *Bulbothrix* Hale: the species with medullary norstictic or protocetraric acids. MycoKeys 2: 1–28. doi: 10.3897/mycokeys.2.2522

Abstract

This study presents data of eight *Bulbothrix* (Parmeliaceae, Lichenized Fungi) species containing norstictic or protocetraric acid in the medulla. The current species delimitations were confirmed. New synonyms are proposed, new characteristics are detailed and range extensions are added.

Key words

Parmeliaceae, salazinic acid, bulbate cilia

Introduction

Bulbothrix Hale was proposed for the group of species called *Parmelia* Series *Bicornutae* (Lynge) Hale & Kurokawa (Hale 1974), characterized by small, lacinate and usually adnate thalli, bulbate marginal cilia, cortical atranorin, simple to branched cilia and rhizinae, smooth to coronate apothecia, hyaline unicellular ellipsoid to bicornute ascospores $5.0\text{--}21.0 \times 4.0\text{--}12.0 \mu\text{m}$, and bacilliform to bifusiform conidia $5.0\text{--}10.0 \times 0.5\text{--}1.0 \mu\text{m}$ (Hale 1976, Elix 1993). In a recent paper presenting a revised generic concept of Parmelioid lichens based on molecular, morphological and chemical evidence (Crespo et al. 2010) include other diagnostic features such as pored epicortex, lack of pseudocyphellae, and presence of isolichenan in the cell walls. *Bulbothrix* is currently nested in the *Parmelina* clade and some species are grouped with *Parmelinella*, making the genus paraphyletic (Crespo et al. 2010).

During a revision of the genus *Bulbothrix* (Benatti 2010) the type specimens and additional material of *Bulbothrix* species were studied. These species have cilia with hollow basal bulbs, which contain differentiated cells and a characteristic oily substance (Hale 1975, Feuerer and Marth 1997, Benatti 2011). This paper discusses the seven species with medullary norstictic acid [*Bulbothrix cinerea* Marcelli & Kalb, *B. lord-howensis* Elix, *B. haleana* Sérusiaux, *B. subcoronata* (Müller Argoviensis) Hale, *B. regnelliana* Jungbluth, Marcelli & Elix, *B. ventricosa* (Hale & Kurokawa) Hale, and *B. viatica* Spielmann & Marcelli], and the single species with protocetraric acid [*Bulbothrix chow-oensis* (Hale) Hale]. New combinations of four species, *Hypotrachyna tuskiiformis* (Elix) Benatti & Marcelli, *Parmelinopsis pinguiacida* (Louwhoff & Elix) Marcelli & Benatti, *P. subinflata* (Hale) Benatti & Marcelli and *Parmotrema yunnanum* (Sheng L. Wang, J.B. Chen & Elix) Marcelli & Benatti, previously placed in *Bulbothrix* (Benatti & Marcelli 2010) were already published after their exclusion due to the lack of true bulbate cilia.

Material and methods

Type material and additional species were studied from B, BM, CANB, DUKE, G, ICN, NY, SP, TUR, UPS, US and from Dr. Klaus Kalb's personal herbarium, originating from Oceania, Asia, North Pacific, Africa, North America, Central America, Caribbean and South America, as well as material collected in Brazil during the last 30 years, mainly by the author and the members of the Lichenological Study Group of the Instituto de Botânica (GEL) in Brazil.

The morphological and anatomical characters of the specimens were analyzed using standard stereoscopic and compound microscopes. Anatomical sections, including those of apothecia and pycnidia when present, were made with a razor blade by hand. Bulbs on cilia, rhizines, apothecia and other thallus parts were checked using the clarification method (Benatti 2011) The chemical constituents were checked by spot tests with potassium hydroxide (K), sodium hypochlorite (C) and para-phenylenediamine (P), and also examined under UV light (360 nm). Chemical constituents of the additional specimens examined were identified by thin-layer chromatography (TLC) using solvent C (Bungartz 2001), and compared with the data on labels left with the specimens. The types had their chemical constituents examined by high performance liquid chromatography (HPLC), following the methods described in Elix et al. (2003).

The presence of norstictic acid is evidenced by a K+yellow→orange or bright red spot test reaction. Its presence is easily confirmed by the formation of tiny star shaped crystals, observed under a light microscope after the transfer of hyphae onto a microscope slide and dropping the reagent on the fungal material, such as cutting a small piece of the thallus or of the apothecia. Protocetraric acid is detected by KC+ rose and P+ reddish orange spot tests reactions, and do not form crystals using K reagent.

The species selected for comparisons are those who show close morphological or chemical similarities, and those most often compared by other authors due to peculiar characteristics.

Results and discussion

The study confirmed seven species containing medullary norstictic acid and one species containing medullary protocetraric acid. Of these, *Bulbothrix cinerea*, *B. lordhowensis* and *B. ventricosa* are isidiate, while *B. chowoensis*, *B. haleana*, *B. subcoronata*, *B. regnelliana* and *B. viatica* only form apothecia. All species are corticolous with the exception of *B. haleana* and *B. cinerea*, which are saxicolous. The only confirmed species containing medullary protocetraric acid is *B. chowoensis*.

The species

***Bulbothrix chowoensis* (Hale) Hale. Phytologia 28(5): 480. 1974.**

Mycobank: MB 341593

Figures 1–2

Basionym. *Parmelia chowoensis* Hale. Phytologia 23: 343. 1972.

Holotype. Zambia, Chowo Forest, Nyika Plateau, leg. M. Jellicoe 53, IV-1969 (BM!, isotype US!).

Description. Thallus subirregular laciniate, turning dusky green in the herbarium, fragments up to 4.3 cm diam., coriaceous, corticolous; upper cortex 12.5–20.0 μm thick, algal layer 15.0–25.0 μm thick, medulla 100.0–155.0 μm thick, lower cortex 15.0–25.0 μm thick. Laciniae irregularly to dichotomously branched, 1.4–3.2 mm wide, imbricate, becoming crowded in the center, adnate to slightly elevate, adpressed to loose, with flat to slightly involute, subrounded to truncate apices, margins flat to slightly involute, crenate to irregular, incised, not lacinulate, axils oval to irregular. Upper surface smooth and continuous at the distal parts, becoming subrugose and transversally cracked at the center, laminal ciliary bulbs absent. Lacinulae absent, even marginal adventitious ones. Maculae absent. Cilia black to occasionally brown, apices simple 0.05–0.30 (–0.70) \times ca. 0.03 mm, with emerse bulbate bases 0.05–0.10 (–0.15) mm wide, frequent throughout the margin spaced 0.05–0.10 mm from each other but becoming more prominent in the axils, absent or scarce at the apices of the laciniae. Soredia pustulae and isidia absent. Medulla white. Lower surface almost uniformly pale brown, except for some random dark brown parts, slightly shiny, smooth to subrugose, moderately rhizinate. Marginal zone brown to dark brown, indistinct from the center, slightly shiny, smooth, slightly papillate. Rhizinae pale brown to partially dark, occasionally with blackish apices, simple, without bulbate bases, 0.10–0.70 \times ca. 0.05 mm, frequent, evenly distributed. Apothecia subconcave to concave or urceolate, adnate to substipitate, 0.3–7.2 mm diam., laminal to submarginal, margin smooth to irregularly subcrenate becoming retorted and fissured when old, ecoronate, amphithecia smooth to subrugose, without ornamentations. Disc dark brown, epruinose, imperforate, epithecium 10.0–15.0 mm high, hymenium 30.0–50.0 μm high, subhymenium 7.5–17.5 μm high. Ascospores subrounded to ellipsoid, 6.0–9.0 (–10.0)



Figures 1–4. Holotype of *Bulbothrix chowoensis* **2** Isotype of *Bulbothrix chowoensis* **3** Holotype of *Bulbothrix cinerea* **4** Detail of the lower side of the holotype. Scale bars = 1 cm.

× 4.5–6.0 mm, epispore ca. 1.0 mm. Pycnidia laminal to submarginal, immerse, with black ostioles. Conidia weakly to evidently bifusiform, 5.0–7.0 × 0.75 µm.

Spot tests. upper cortex K+ yellow, UV-; medulla K-, C-, KC+ rose, P+ reddish orange, UV-.

TLC/HPLC. cortical atranorin, medullary protocetraric and conprotocetraric acids (see also Hale 1972, 1976). Analysis made by Dr. John A. Elix showed also salazinic and consalazinic acids on the isotype. In view of the condition of the collection, I believe it is a possible contaminant from mixed fragments of other thalli, since they are much agglomerated.

Distribution. Africa: Mozambique, Zambia (Hale 1972, 1976).

Comments. The holotype (Fig. 1) and the isotype (Fig. 2) consist of two fragments; the original specimen was apparently separated in half. Both type fragments are in good condition, but are still attached to a small twig which is glued to a card, making it difficult to clearly see the lower cortex. Both fragments contain well-developed apothecia and many pycnidia with mature ascospores and conidia.

Compared to the original description (Hale 1972), the investigated type material showed some differences in the thallus anatomy. The thicknesses mentioned by Hale for the upper cortex (14.0–18.0 µm), the algal layer (10.0–15.0 µm), medulla (70.0–90.0 µm) and lower cortex (12 µm) are smaller than those found here, especially for the medulla. The ascospores found were slightly larger.

This is the only true species of *Bulbothrix* with medullary protocetraric acid currently known, since *B. subinflata* (Hale) Hale proved to be a *Parmelinopsis* species (Benatti and Marcelli 2010).

Although the ciliary bulbs of *B. chowoensis* are small and not as evident as in other species of the genus, they are noticeable even with the thickening of the marginal black line, and are even more easily seen when this line is brownish. The bulbs, even when subtle, have the typical anatomical structure containing idioblast cells and an oily substance (Hale 1975, Feuerer and Marth 1997, Benatti 2011).

Bulbothrix hypocraea (Vainio) Hale differs from *B. chowoensis* by the evidently maculate upper cortex, larger and more evident bulbate cilia, larger ascospores (8.0–14.0 µm long) and by the presence of medullary salazinic acid.

Bulbothrix setschwanensis (Zahlbruckner) Hale differs in having – like *B. hypocrea* – larger and more evident bulbate cilia, larger ascospores (12.0–19.0 µm long) and medullary salazinic acid.

Bulbothrix viatica Spielmann & Marcelli differs by the coronate apothecia, common and constant occurrence of laminal ciliary bulbs, larger ascospores (12.0–18.0 µm long), variable coloration of the lower cortex and by the presence of medullary norstictic acid.

Bulbothrix regnelliana Jungbluth, Marcelli & Elix differs by the coronate apothecia, the ascospores size (8.0–12.0 µm long) and by the presence of medullary norstictic acid.

Bulbothrix subcoronata (Fée) Hale differs in by the black lower cortex with brown margins, coronate apothecia, and smaller ascospores (5.0–7.5 × 4.0–5.5 µm).

***Bulbothrix cinerea* Marcelli & Kalb. Mitteilungen aus dem Institut für Allgemeine Botanik Hamburg 30/32: 127. 2002.**

Mycobank: MB 427200

Figures 3–4

Holotype. Brasil, Bahia, Serra do Tombador, between Mundo Novo and Morro do Chapéu, alt. 1000 m, leg. K. Kalb s.n., 18/20-VII-1980 (K. Kalb pers. herb. 20931!).

Description. Thallus sublinearly laciniate, turning dusky gray in the herbarium, fragments up to 3.8 cm diam., subcoriaceous, saxicolous; upper cortex 12.5–17.5 μm thick, algal layer 25.0–37.5 μm thick, medulla 62.5–75.0 μm thick, lower cortex 12.5–22.5 μm thick. Laciniae irregularly or in part anisotomically dichotomously branched, 0.4–1.6 (–2.5) mm wide, slightly imbricate becoming more crowded in the center, strongly adnate and very appressed, with flat, truncate to subtruncate apices, the margins flat, crenate to subcrenate or somewhat subirregular, entire to slightly incised, sometimes sublacinulate, the axils oval, upper surface smooth and continuous occasionally with irregular cracks in older parts, laminal cilia bulbs absent. Lacinulae marginal, adventitious, scarce, randomly appearing in old parts, short, flat, simple to furcate or irregularly branched, truncate, underside pale brown concolorous with the lower marginal zone, 0.2–1.5 \times 0.1–0.7 mm. Maculae absent. Cilia black, without apices or with very brittle, simple and downward-bent apices, 0.05–0.40 \times ca. 0.03 mm, with semi-immersed to emergent bulbate bases 0.10–0.20 (–0.30) mm wide, frequently throughout the margins spaced ca. 0.05 mm from each other to occasionally contiguous, in small groups or solitary in the crenulations and axils, often reniform and withered, becoming absent or scarce at the apices of the laciniae. Soredia and pustulae absent. Isidia frequent, laminal, granular to smooth cylindrical \pm irregular, occasionally slightly flattened or somewhat dilated (but not inflated), straight, 0.05–0.30 (–0.65) \times ca. 0.05–0.15 (–0.30 when dilated) mm, simple to sometimes sparsely branched, erect, firm although brittle, quite shiny with brown or blackish apices, eciliate (sometimes swollen and resembling thick pycnidia, see comments). Medulla white. Lower surface almost uniformly pale brown, except for some darker marginal parts, shiny, smooth, slightly papillate, moderately rhizinate. Marginal zone brown to dark brown, almost indistinct from the center, shiny, 0.5–1.0 mm wide, smooth, papillate or slightly rhizinate. Rhizinae brown to dark brown, simple, generally with dark bulbate bases, 0.10–0.60 \times ca. 0.05 (–0.10) mm, frequent, evenly distributed. Apothecia sub-concave to concave, adnate to substipitate, 0.3–3.7 mm diam., laminal, margin crenate to dentate and incised, coronate, the bulbs frequently interrupting the continuity of the margin leaving them lobulate, amphithecia smooth without ornamentations when young becoming gradually more isidiate and sometimes forming ciliary bulbs with progressing development. Disc light or meaty brown, epruinose, imperforate, epithecium 7.5–12.5 μm high, hymenium 45.0–55.0 μm high, subhymenium 25.0–32.5 μm high. Ascospores ellipsoid to oval, 10.0–13.5 \times 6.0–7.5 (–8.5) μm , epispore ca. 0.5 μm . Pycnidia laminal (a lichenicolous fungus resembling pycnidia may occur on the isidia), immersed, with brown or black ostioles. Conidia weakly bifusiform, 5.0–6.0 \times 1.0 μm .

Spot tests. upper cortex K+ yellow, UV-; medulla K+ yellow→orange or light red, C-, KC-, P+ orange, UV-.

TLC/HPLC. cortical atranorin, medullary norstictic and connorstictic acids (see also Marcelli and Ribeiro 2002).

Distribution. South America: Brazil - Bahia (Marcelli and Ribeiro 2002) and Minas Gerais (Ribeiro 1998, Marcelli and Ribeiro 2002).

Additional specimen examined. Brazil, Minas Gerais State, Catas Altas Municipality, Serra do Caraça, Parque Natural do Caraça, on sun exposed rock at the trail at the edge of riparian, leg. M.P. Marcelli & C. H. Ribeiro 31971, 09-IX-1997 (SP).

Comments. The holotype (Fig. 3) consists of several small fragments (between 0.5 and 4.0 cm diam.) in good condition, free of substrate, not being glued to a card voucher. The lower cortex is easily viewable. On most of the fragments there are several apothecia in various stages of maturation, but not all fragments have apothecia containing mature ascospores.

Until the discovery of this species, *B. decurtata* (Kurokawa) Hale was the only other known species of the genus that appeared to be obligatory saxicolous. In view of the very fragmentary condition of the analyzed material, *B. cinerea* seems to be a species whose thalli are very closely attached to the substrate and difficult to collect, as noted already by the authors (Marcelli and Ribeiro 2002).

The accentuated gray tinge of the thalli seen in *B. cinerea* is unusual among *Parmeliaceae* (Marcelli & Ribeiro 2002). Its isidia also have some peculiarities. Their dark apices are somewhat bright in young stages and can, at this stage, be confused with laminal ciliary bulbs [like those found in specimens of *B. ventricosa* (Hale & Kurokawa) Hale], parasitic fungi, or pycnidia.

Cross-sections of the isidia reveal, however, the typical anatomical structure: they are only covered by a thin dark “skin” [similar to the isidia of the saxicolous species *B. decurtata* (Kurokawa) Hale] and lack a compact cortex cover. This dark coverage is restricted to the apices of the isidia when they are mature.

Common among isidia on both specimens studied are large, globose, blackened structures about 0.10–0.30 mm wide. They are mainly visible in the more inflated isidia and might be of parasitic nature. Morphologically they are identical to laminal pycnidia, but conidia were not found in sections under the microscope.

As explained by the authors (Ribeiro and Marcelli 2002), *B. cinerea* tends to have marginal cilia without apices or with simple apices curved downward toward the substrate, leaving only the bulbs visible when casually observed from above. Sometimes scars or remnants of brittle apices can be observed. Several of the bulbs, however, notably those who developed in parts of the thallus unlikely to “anchor” it to the substrate, do not show any signs of apex development.

Bulbothrix isidiza (Nylander) Hale differs by being corticolous with a more light tinged cortex, having laciniae twice as large as those of *B. cinerea* (2.0–5.5 mm wide), isidia that are never pycnidiate and not becoming swollen or lobulate, and having salazinic acid as medullary substance.

Bulbothrix ventricosa also differs from *B. cinerea* by being corticolous, having a lighter tinge with larger laciniae (1.5–4.5 mm wide), never having pycnidiate isidia that are concolor to the cortex which do not become swollen or lobulate, and the often variable mottled colored lower cortex, as well as the fairly common presence of laminal ciliary bulbs.

Bulbothrix decurtata differs from *B. cinerea* by having both a black lower cortex and rhizinae, and salazinic acid as medullary substance. Although when undeveloped the isidia of both species are somewhat similar (curiously, only saxicolous species of the genus appear to form blackened isidia), its development is well differentiated. Isidia on *B. cinerea* grow larger and thicker, often appearing to be inflated (but not really pustular) or getting flattened acquiring an aspect similar to lobules. The isidia of *B. decurtata* are small and near always completely blackened, even in advanced stages of development. Pycnidia do not develop in the isidia of *B. decurtata*.

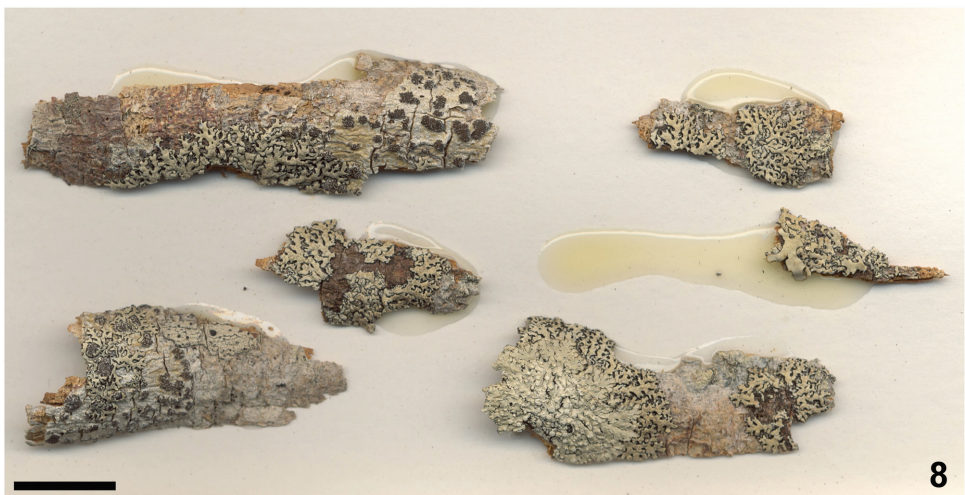
***Bulbothrix haleana* Sérusiaux. The Bryologist 87(1): 2. 1984.**

Mycobank: MB 106639

Figures 5–7

Holotype. Zaire, Massif du Kahuzi, un peu au nord de la piste du Kahuzi, sur le versant sud-ouest du mont, bloc rocheux (type porphyre) au ras du sol dans une lande à *Erica bequaertii* et *Philippia benguelensis*, alt. 2780 m., leg. J. Lambinon 71/Z/1356, 30-XII-1971 (LG!, isotype US!).

Description. Thallus subirregular to partially sublinearly sublaciniate, turning light dusky gray in the herbarium, fragments up to 3.6 cm diam., coriaceous, saxicolous; upper cortex 15.0–25.0 μm thick, algal layer 37.5–52.5 μm thick, medulla 42.5–80.0 μm thick, lower cortex 20.0–30.0 μm thick. Laciniae irregularly ramified to occasionally dichotomously branched, (0.7-) 1.5–5.2 mm wide, slightly imbricate becoming partially crowded in the center, weakly adnate and loosely adpressed, with flat to involute, subrounded to subtruncate apices, the margins flat, smooth to crenate or partially irregular, entire to slightly incised, not lacinulate, the axils oval to irregular, upper cortex continuous, smooth to subrugose, occasionally with irregular cracks on older parts, laminal ciliary bulbs absent. Lacinulae absent, not even adventitious ones in older parts. Maculae punctiform, laminal, usually distinct but weaker in some parts. Cilia black or occasionally dark brown, with simple to occasionally furcate and partially downward-bent apices, 0.10–0.55 (-1.00) \times 0.04–0.05 mm, usually with emerse bulbate bases (0.05-) 0.10–0.15 mm wide but partially not bulbate (bulbs aborted?), sometimes the bulbs being taken along by the apices with the cilia growth, frequent along the margins spaced 0.05–0.20 mm from each other to rarely contiguous, solitary or in small groups in the crenulations and axils, usually absent or scarce in the apices of the laciniae and adjacent areas. Soredia, pustulae and isidia absent. Medulla white. Lower surface pale brown to cream colored, sometimes with small dark brown spots in the center, slightly shiny to opaque, smooth to partially subrugose, moderately



Figures 5–8. Holotype of *Bulbothrix haleana* **6** Isotype of *Bulbothrix haleana* **7** Detail of the lower side of the isotype **8** Holotype of *Bulbothrix lordhowensis*. Scale bars = 1 cm.

rhizinate up to the margins. Marginal zone indistinct from the center to slowly attenuate, pale brown to brown, opaque to slightly shiny, smooth, weakly to moderately rhizinate. Rhizinae light to dark brown or sometimes blackened, generally with whitish apices, simple, becoming sometimes furcate or irregularly branched, partially with bulbate bases or displaced bulbs, $0.10\text{--}0.70$ (-1.30) \times ca. $0.05\text{--}0.10$ mm, frequent to abundant, evenly distributed. Apothecia subplane to concave, sessile to adnate or substipitate, $0.2\text{--}6.3$ mm diam., laminal to submarginal, margins smooth becoming subcrenate, ecoronate, amphithecium smooth becoming rugose, without ornamentations. Disc light to dark brown, epruinose, imperforate, epithecium $10.0\text{--}15.0$ μm high, hymenium $32.5\text{--}45.0$ μm high, subhymenium $15.0\text{--}22.5$ μm high. Ascospores ellipsoid to oval or subglobose, (5.0--) $6.0\text{--}8.0$ (-9.0) \times (4.0--) $5.0\text{--}7.0$ μm , epispore ca. 1.0 μm . Pycnidia laminal, commonly on the distal parts of the laciniae, immersed, with black ostioles. Conidia bacilliform to weakly bifusiform, $5.0\text{--}8.0 \times 1.0$ mm.

Spot tests. upper cortex K+ yellow, UV-; medulla K+ yellow \rightarrow reddish orange, C-, KC-, P+ orange, UV-.

TLC/HPLC. cortical atranorin, medullary norstictic and connorstictic acids (examined and confirmed by samples sent to Jack A. Elix; Sérusiaux 1984 mentioned medullary salazinic acid).

Distribution. Africa. Zaire (Sérusiaux 1984).

Comments. Both the holotype (Fig. 5) and the isotype (Figs. 6–7) are small fragments between 1.0 and 3.5 cm in diameter. Both are in good condition, only slightly damaged, and not glued to cards, which made the investigation of the lower cortex possible. Inside the packet are small envelopes, containing very small fragments and loose/detached apothecia.

Although the species was originally described as containing medullary salazinic acid, the substance confirmed by microchemical tests and chromatography was norstictic acid. It is the only species currently known within this chemical group with ecoronate apothecia.

Sérusiaux (1984) mentioned laciniae $1.0\text{--}3.0$ mm wide, but the laciniae of the type material are larger, $1.5\text{--}5.0$ mm wide. As for the ascospores, the measurements obtained were $6.0\text{--}9.0 \times 4.0\text{--}7.0$ μm , a little larger than in the original description.

Sérusiaux (1984) also described the upper cortex as "not maculate on young lobes, becoming more or less maculate elsewhere". I found that distal parts of the younger lobes show no signs of maculae, but in most of the thallus, especially the older parts, the maculae are punctiform and dense, like those observed in species such as *B. hypocraea*.

Most of the cilia present typical inflated bases, but it is not uncommon that cilia without inflated bases are occasionally found among groups of cilia with inflated bases. Interestingly, in some cilia the bulb is displaced from the base. However, it is hardly found above the first third of the cilia length. It is uncertain why some cilia have no bulbs; maybe they were aborted or maybe they are not formed until a later stage of development.

The lower cortex is almost entirely brown, and in a few small spots more restricted to the central portions of the thallus it becomes a little darker. Sérusiaux (1984) wrote

that the cortex could become almost whitish in some parts, but due to colour change after longer stay in the herbarium it is difficult to confirm this assertion. Most of the rhizinae have basal or displaced bulbs.

Sérusiaux (1984) commented on the presence of black dots he supposed to be pycnidia, but he did not find sterigmata or conidia. In fact, conidia are difficult to find in the type material, but when they are found the size and shape is typical for the genus. At the first sight the pycnidia were taken for laminal ciliary bulbs or parasitic fungi, but this was proven to be incorrect.

Sérusiaux (1984) distinguished *B. haleana* from other species of the genus by the saxicolous habit, the light color of the lower surface and the small size of the ascospores. *Bulbothrix bulbochaeta* (Hale) Hale, *B. chowoensis* (Hale) Hale, *B. confederata* (W. L. Culberson) Hale, and *B. laevigatula* (Nylander) Hale, which have also small ascospores (≤ 10 μm long), differ chemically and morphologically from *B. haleana*. Other *Bulbothrix* species containing medullary salazinic acid were differentiated by the author mainly by the larger ascospores, ranging from 8.0–12.0 to 14.0–20.0 μm long.

Bulbothrix haleana is morphologically similar to *B. hypocraea*, but can be distinguished by the corticolous habit, ascospores size (6.0–8.0 vs. 8.0–14.0 μm long), and medullary chemistry (norstictic acid vs. salazinic acid). There is some lower cortex tone difference between the types, but it may be due to the degree of medullary norstictic and salazinic acids oxidation. The holotype of *B. hypocraea* has more strongly bent cilia and is even more maculate, while the rhizinae of *B. haleana* appear to be more frequently bulbate. All other characters are similar.

Bulbothrix decurtata (Kurokawa) Hale differs by the more linear laciniae, an emaculate and quite fissured upper cortex, the formation of blackish small isidia, a predominantly black lower cortex and rhizinae without basal bulbs.

Bulbothrix cinerea Marcelli & Kalb also has medullary norstictic acid, a similar pale brown lower cortex and cilia aspect, but differs from *B. haleana* by the sublinear and dichotomously branched laciniae, emaculate upper cortex, simple laminal isidia with brown or blackish apices, and by the coronate apothecia.

***Bulbothrix lordhowensis* Elix. Mycotaxon 56(1): 231. 1995.**

Mycobank: MB 412620

Figure 8

Holotype. Australia, New South Wales, Lord Howe Island, along track to Mutton Bird Point, 31°32'45"S, 159°05'00"E, 60 m alt., dry lowland forest with basalt outcrops, on dead canopy branches, leg. J. A. Elix 32781, 21-VI-1992 (CANB!, isotypes HO and MEL).

Description. Thallus sublinearly to linearly laciniate, turning pale dusky green in the herbarium, fragments up to 2.2 cm diam., subcoriaceous, corticolous; upper cortex 12.5–20.0 μm thick, algal layer 15.0–22.5 μm thick, medulla 57.5–70.0 μm thick, lower cortex 15.0–22.5 μm thick. Laciniae dichotomously or trichotomously branched or oc-

asionally slightly irregularly ramified, 0.3–0.6 mm wide, contiguous to occasionally imbricate or rarely crowded, adnate and appressed, with flat to slightly involute, subtruncate to truncate apices, the margins flat to subconvex, crenate to subirregular, entire to slightly incised and occasionally sublacinulate, the axils oval or irregularly shaped, upper cortex continuous and smooth, frequently with irregular cracks mainly on older parts, laminal ciliary bulbs common and frequent. Lacinulae scarce, marginal and adventitious, short, flat, 0.10–0.60 × 0.05–0.20 mm, simple or irregularly branched, truncate or sometimes acute, underside concolorous with the lower marginal zone. Maculae absent (not to be confused with marks left by detachment of the isidia, sometimes deep, exposing the medulla). Cilia black or occasionally brown, with simple to furcate or trifurcate apices, sometimes subdichotomously branched in the axils, 0.05–0.25 (–0.40) × ca. 0.03 mm, with semi-immersed to emergent bulbate bases ca. 0.05 (–0.10) mm wide, contiguous along the margins or up to 0.5 mm spaced from each other, usually absent or scarce on the apices of the laciniae. Soredia and pustulae absent. Isidia frequent, laminal, granular to short smooth cylindrical, straight, 0.05–0.10 (–0.20) × ca. 0.05 mm, simple to sometimes sparsely branched, erect, firm to caducous, darkened and with dark brown apices, eciliate. Medulla white. Lower surface black, shiny, smooth to subrugose, densely rhizinate with some open parts. Marginal zone attenuate, brown, shiny, 0.3–0.5 mm wide, smooth, generally rhizinate. Rhizinae black, sometimes with brown apices, initially simple becoming furcate and then dichotomous, apparently without bulbs, 0.10–0.40 × ca. 0.03–0.05 mm, abundant, evenly distributed. Apothecia and pycnidia not found.

Spot tests. upper cortex K+ yellow, UV-; medulla K+ yellow→orange, C-, KC-, P+ orange, UV-.

TLC/HPLC. cortical atranorin and chloroatranorin, medullary norstictic acid and two unknown substances (Elix 1995).

Distribution. Oceania. Australia (Elix 1995).

Comments. The holotype (Fig. 8) consists of six small fragments in good condition, along with a small and fragile fragment. Isidia are or were present on all specimens; the latter can be identified by the marks that are left where the isidia broke off. A fragment is covering a *Sarcographa* specimen, while another fragment is partially covered by a small, sorediate *Physcia* specimen.

There are frequent laminal ciliary bulbs in the holotype. Part of the observed laminal bulbs were first interpreted as poorly developed pycnidia or even parasitic fungi, which has been proven wrong. Besides being generally small in size also in the margins, some of the laminal bulbs are poorly developed.

This is one of the species with the narrowest laciniae in the genus, barely exceeding 0.5 mm in width. The cilia are evidently bulbate, with very small bulbs. Bulbs were not seen in the rhizinae, and if they occur, they should be rare and very subtle. The isidia are very small and appear as unornamented, darkened grains. When detached, they can leave strong marks, resembling spilled medulla that comes out through the cortex. They are easily distinguishable from maculae.

Bulbothrix queenslandica (Elix & Stevens) Elix (MEL!, US!), differs by the larger laciniae (0.5–1.5 mm wide), cortical maculae, concolorous and ciliate isidia, and the

absence of medullary substances. *Bulbothrix pigmentacea* (Hale) Hale probably has only small amounts of gyrophoric acid, and random spots of a K⁻ reddish pigment in the medulla, rhizinae and lower cortex. For comparison of *B. lordhowensis* with *B. queenslandica* and *B. pigmentacea* (Hale) Hale, see also Elix (1995).

Among the isidiate species with medullary norstictic acid, *B. ventricosa* (Hale & Kurokawa) Hale differs by the larger laciniae (1.0–5.0 mm wide) with rounded apices, less frequent cilia and rhizinae with simple apices, larger and simple, concolorous isidia (which leave no such conspicuous marks as in *B. lordhowensis*), and by the frequently mottled coloration of the lower cortex. *Bulbothrix cinerea* Marcelli & Kalb differs from *B. lordhowensis* by being saxicolous, having larger laciniae (0.5–2.5 mm wide), and lacking laminal ciliary bulbs. It has cilia and rhizinae with simple apices and a pale brown lower cortex.

Bulbothrix subtabacina (Elix) Elix (MEL!, CANB!) has larger laciniae (0.5–1.0 mm wide), a maculate and very brittle upper cortex, concolorous isidia, and medullary salazinic acid. *Bulbothrix tabacina* (Montagne & Bosch) Hale (L!, PC!) has even larger (1.0–5.0 mm wide), irregularly branched laciniae with more rounded apices, cilia and rhizinae with simple apices, and also contains medullary salazinic acid.

***Bulbothrix regnelliana* Jungbluth, Marcelli & Elix. Mycotaxon 104: 58. 2008.**

Mycobank: MB 511169

Figures 9–10

Holotype. Brazil, São Paulo State, São José do Rio Preto Municipality, 20°49'S, 49°22'W, 489 m alt., on palm tree trunk in open field, D.F. Peralta 2325, 09-IV-2004 (SP!, iso-type B!).

Description. Thallus subirregular sublaciniate, dusky gray in herbarium, fragments up to 4.6 cm diam., subcoriaceous, corticolous; upper cortex 12.5–17.5 µm thick, algal layer 20.0–25.0 µm thick, medulla 75.0–92.5 µm thick, lower cortex 12.5–17.5 µm thick. Laciniae irregularly ramified to occasionally anisotomically dichotomously branched, (1.0–) 1.6–2.5 (–3.7) mm wide, imbricate becoming crowded in the center, weakly adnate to loose and ascending, with flat to involute, subrotund apices, the margins flat to involute frequently giving the laciniae a subcanaliculate aspect, crenate to subirregular, entire to irregularly incised, not lacinulate, the axils oval to irregular, upper cortex continuous with rare, random irregular fissures, smooth, laminal ciliary bulbs absent. Lacinulae absent, not even marginal adventitious ones present. Maculae absent. Cilia black, apices frequently absent to less commonly simple and short, 0.05–0.25 × ca. 0.03 mm, with emerse bulbate bases (0.05–) 0.10–0.35 mm wide, frequently along the margins in the crenulations and axils of the laciniae spaced 0.05–0.10 mm from each other, occasionally becoming contiguous, solitary or in small groups, becoming absent or scarce at the apices of the laciniae and adjacent parts. Soredia, pustulae and isidia absent. Medulla white. Lower cortex pale brown to brown, sometimes appearing to be darker in some parts due to groups of dark

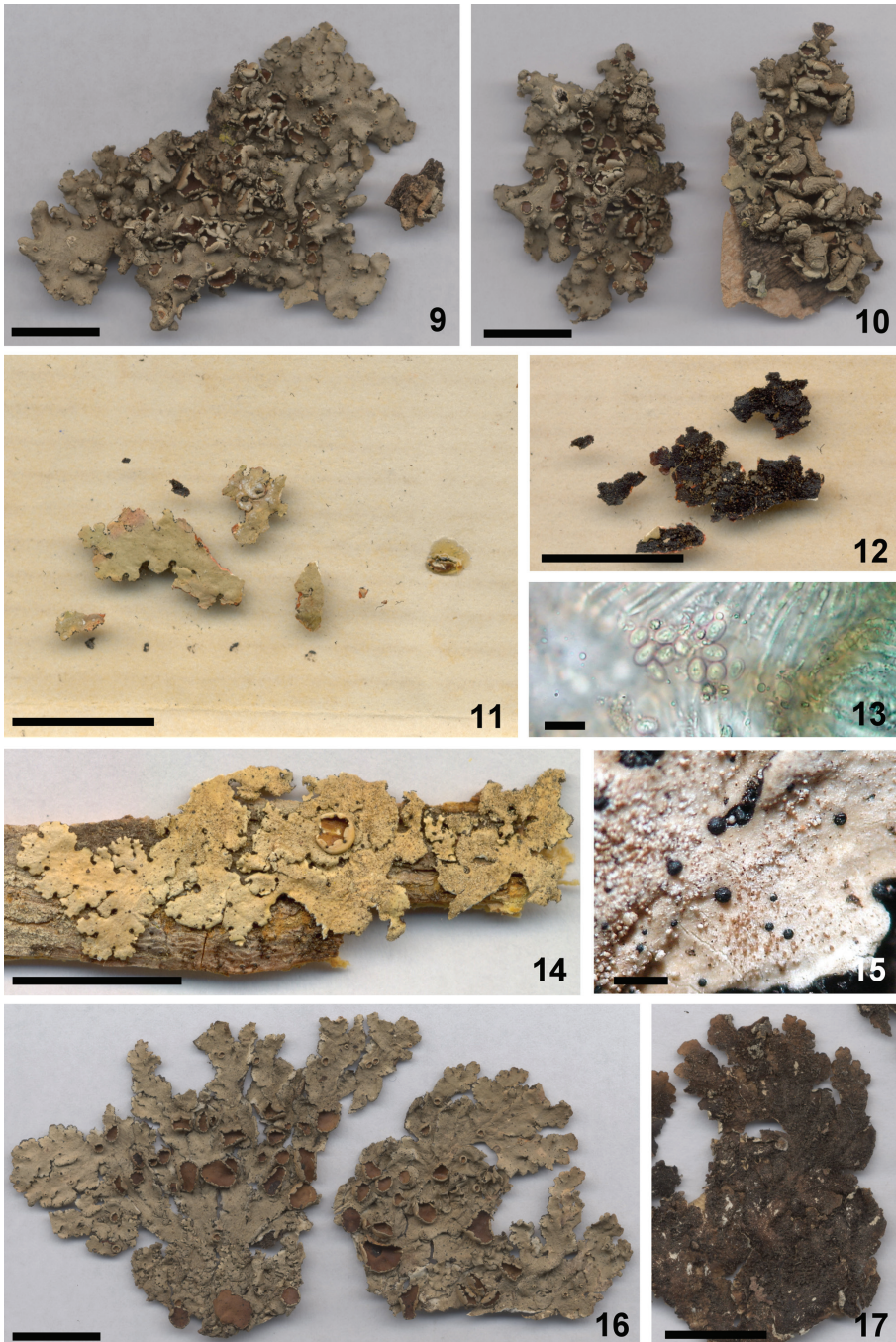


Figure 9–17. Holotype of *Bulbothrix regnelliana* **10** Isotype of *Bulbothrix regnelliana* **11** Lectotype of *Bulbothrix subcoronata* **12** Detail of the lower side of the lectotype **13** Ascospores from the apothecium on fig. **11** **14** Lectotype of *Bulbothrix ventricosa* **15** Detail of the laminal bulbs amidst the isidia **16** Holotype of *Bulbothrix viatica* **17** Detail of the lower side of the holotype. Scale bars = 1 cm (**9**, **10**, **11**, **12**, **14**, **16**, **17**), 1 mm (**15**), and 10 μ m (**13**).

rhizinae, opaque, rugose, moderately to densely rhizinate. Marginal zone brown to pale brown, not distinct from the center, opaque to slightly shiny, rugose or weakly venate, papillate, becoming slightly rhizinate towards the center. Rhizinae brown to pale brown, occasionally dark, black or with whitish apices on random parts, simple or rarely irregularly branched, generally with blackish bulbate bases of dislocate bulbs, 0.10–0.50 (–0.80) × 0.03–0.10 mm, frequent to abundant, commonly agglutinated, evenly distributed. Apothecia concave to urceolate, adnate to substipitate, 0.3–7.5 mm diam., laminal, margins crenate becoming deeply crenate, fissured and folded as they age, coronate (bulbs irregularly appearing in the crenulations), amphithecium smooth to rugose without ornamentations. Disc brown, epruinose, imperforate, epithecium 10.0–15.0 mm high, hymenium 25.0–40.0 μm high, subhymenium 20.0–30.0 μm high. Ascospores ellipsoid to oval, (7.0–) 8.0–12.0 (–14.0) × 4.0–7.0 (–8.0) μm, epispore ca. 1.0 μm. Pycnidia frequent, submarginal to subapical or sometimes laminal, immerse, with black ostioles; conidia bacilliform to weakly or distinctly bifusiform, (4.0–) 5.0–7.5 (–9.0) × 1.0 μm.

Spot tests. upper cortex K⁺ yellow, UV⁻; medulla K⁺ yellow→orange or light red, C⁻, KC⁻, P⁺ orange, UV⁻.

TLC/HPLC. cortical atranorin, medullary norstictic acid and four unknown substances (see also Jungbluth 2006, Jungbluth et al. 2008).

Distribution. South America. Brazil: São Paulo (Jungbluth 2006 as *B. subcoronata*, Jungbluth et al. 2008). Here is reported for Paraguay, Argentina, and Brazilian States of Minas Gerais and Rio Grande do Sul.

Additional specimens examined. Paraguay, Paraguari, Parque Nacional Ybycuí, along road/trail to Salto Mbocharuzú on Rio Corrientes, ca. 200 m, ca. 26°05'S, 56°53'W, dry Forest and extensive sandstone outcrops in cerrado, leg. W.R. Buck 12006a, 6-X-1984 (NY). Argentina, Corrientes, Depto. Capital, 500 m de tuta 12, camino a Santa Ana, em quebranchal, leg. L. Ferraro 1287, 05-VI-1978 (US). Idem, Depto. Esquina, 10 km S de ruta 126, camino de Tres Bocas a Paso Yunque, leg. A. Krapovickas 28074, 13-III-1975 (US). Idem, Misiones, San Ignacio, pastoreo Grande, em bosque despejado, sobre ramas de *Astronium balansae* y *Helietta cuspidata*, 290 m, leg. J. E. Montes 10060 pr. p., 20-III-1956 (US). Brasil, Minas Gerais State, Catas Altas Municipality, Serra do Caraça, Parque Natural do Caraça, on tree trunk at the foot of the Morro do Calvário at the side of the hotel, leg. M.P. Marcelli & A.E. Luchi 29654, 10-XI-1995 (SP). Idem, São Paulo State, Serra Negra Municipality, Alto da Serra, near the television tower, on small tree twig on the edge of the illuminated and humid mountainous forest, leg. M.P. Marcelli, O. Yano & A.B. Carvalho 22703, 05-IV-1993 (SP). Idem, Santa Rita do Passa Quatro Municipality, Vassununga farm, km 259 of the Anhanguera highway, 760 m alt., transition from cerrado to cerradão, on thin twig, leg. M.P. Marcelli & B. L. Morretes 16057, 27-IX-1978 (SP). Idem, Rio Grande do Sul State, Esmeralda Municipality, Estação Ecológica Aracuri, on cortex of *Schinus polygamus*, 920 m alt. leg. M. Fleig 1830, 12-XII-1982 (ICN).

Comments. The holotype (Fig. 9) and the isotype (Fig. 10) consist of two fragments in good condition, free of substrate, not glued to the voucher card, which made

the observation of the characters of the lower cortex possible. Both have numerous apothecia, although it is difficult to find ascospores (hymenia often without asci).

Several authors determined specimens of *B. regnelliana* Jungbluth, Marcelli & Elix as *B. subcoronata* (Müller Argoviensis) Hale or *B. viatica* Spielmann & Marcelli (e.g. Eliasaro 2001, Ribeiro 1998). These three species form a closely related group, in which the species are distinguished mainly by the color of the lower cortex, the size of ascospores and the presence or absence of laminal ciliary bulbs.

Although Jungbluth (2006) made an attempt to relate the shape of apothecia with the size of the ascospores in order to separate the species with norstictic acid, a close examination of the material of *B. subcoronata*, *B. regnelliana* and *B. viatica* demonstrated that this is not a reliable character for the species separation due to character overlap. In fact there are specimens interpreted as *B. subcoronata* with ascospores ca. 7.0–12.0 μm long (Hale 1976, Fleig 1985) and others with ascospores 10.0–20.0 μm long (Marcelli 1993, Eliasaro 2001, Ribeiro 1998).

Based on the color of the lower cortex and the ascospore size, the material examined by Hale (1976), which was described as *B. subcoronata*, should probably belong to *B. regnelliana*, as assumed by Jungbluth et al. (2008). It is also possible that the material examined by Fleig (1985), described with ascospores $\leq 10 \mu\text{m}$, belongs to *B. regnelliana*.

In fact, the type specimen of *B. subcoronata* has a shiny black lower cortex with a well defined brown marginal zone, and a single, coronate apothecium, containing very small ascospores (5.0–7.5 \times 4.0–5.5 μm). *Bulbothrix subcoronata* is further distinguished from *B. regnelliana* by the smaller width of the laciniae (ca. 0.5–1.0 mm), the more frequent marginal cilia often with simple apices, and the retrorse rhizinae on the amphithecium of the apothecia.

Bulbothrix viatica and *B. regnelliana* have several characteristics in common, which lead to the hypothesis that they were synonymous. Some specimens with overlapping characters were found; this concerned the absence of laminal ciliary bulbs, marginal cilia with and without apex, a brown lower cortex with small dark spots and ascospores 10.0–14.0 μm long. However, when analyzing the characteristics of the specimens, verifying the collection sites and comparing the material side by side, a correlation of small features was noticed that include the total absence of laminal ciliar bulbs, an emaculate upper cortex, cilia often without apices, a strictly brown lower cortex and ascospores usually $\leq 12 \mu\text{m}$ long in *B. regnelliana*, which are apparently constant and related to the possible geographic distribution of the species. We therefore decided not to put them into synonymy. The region of the Tropic of Capricorn seems to represent the northern limit of distribution for *B. regnelliana*, while the latitude of Rio Grande do Sul State in Brazil may represent the southern limit of distribution for *B. viatica*. Thus, there is a common area of occurrence for both. Also some very few specimens mentioned (Ribeiro 1998) with large ascospores, that are known only from the north of Minas Gerais State, also in Brazil, that might represent an undescribed taxa maybe overlapping with the distribution of *B. viatica*.

Bulbothrix ventricosa (Hale & Kurokawa) Hale differs from *B. regnelliana* by having the same characteristics as *B. viatica*, and the presence of maculae as well as laminal

isidia. The coloration of the lower cortex shows an even more frequent mixture variation (i.e., much more varied mixes of black and brown tones) in *B. ventricosa* than in *B. viatica*.

Bulbothrix hypocraea (Vainio) Hale differs by the densely maculate upper cortex, marginal cilia with simple apices, ecoronate apothecia and medullary salazinic acid.

Bulbothrix continua (Lyngé) Hale differs by the sublinear and dichotomous laciniae, abundant and contiguous bulbate cilia with long apices bent downwards, rhizinae without basal bulbs, ecoronate apothecia and medullary salazinic acid. *Bulbothrix linteolcarpa* Marcelli is similar to *B. continua*, but has narrower laciniae (0.3–0.5 mm wide), simple to branched rhizinae, flat apothecia straining over the laciniae, and slightly larger ascospores 10.0–15.0 × 6.5–8.0 µm.

Bulbothrix setschwanensis (Zahlbruckner) Hale differs by the frequent marginal cilia usually with simple apices, rhizinae without basal bulbs, ecoronate apothecia with larger ascospores 12.0–19.0 µm long, and medullary salazinic acid.

Relicina subabstrusa (Gyelnik) Hale (Hale 1975, Elix 1996) differs by having cortical usnic acid, laciniae more linear, cilia regularly with apices and not only restricted to the axils, and apothecia with bulbs or retrorse rhizinae on the amphithecium (as in *B. subcoronata*) containing smaller ascospores (7.0–8.0 × 4.0–5.0 µm).

***Bulbothrix subcoronata* (Müller Argoviensis) Hale. *Phytologia* 28: 481. 1974.**

Mycobank: MB 341614

Figures 11–13

Basionym. *Parmelia subcoronata* Müller Argoviensis. *Revue Mycologique*: 135. 1887.

Holotype. South America, place and collector unknown (G!, holotype).

Description. Thallus subirregularly to almost sublinearly sublaciniate, turning dusky green in the herbarium, fragments up to 1.2 cm diam., submembranaceous, corticolous (anatomy not observed in view of the scarce material). Laciniae anisotomically dichotomously branched, contiguous, 0.4–1.0 mm wide, weakly adnate and apparently loosely adpressed, with flat, truncate to subtruncate apices, the margins flat, slightly sinuous to subcrenate, entire, not lacinulate, the axils oval, upper cortex continuous and smooth, laminal bulbate cilia absent. Lacinulae absent, not even marginal adventitious ones. Maculae absent. Cilia black, usually with simple to rarely lacking apices, short, occasionally downward-bent, 0.05–0.40 (-0.60) × ca. 0.03 mm, with emerse bulbate bases 0.05–0.10 (-0.15) mm wide, frequently along the margins in small groups in the crenulations and axils of the laciniae, spaced 0.05–0.15 mm from each other, becoming absent or scarce only at the apices of the laciniae. Soredia, pustulae and isidia absent. Medulla white (but tainted by the degenerated medullary acid). Lower surface black, shiny, smooth, papillate to slightly rhizinate. Marginal zone brown, attenuate, up to 0.5 mm wide, shiny, smooth, naked to papillate, becoming occasionally slightly rhizinate in the transition for the center. Rhizinae black, simple, commonly with subtle to conspicuous bulbate bases, 0.10–0.50 × 0.02–0.05 mm, fre-

quent, randomly grouped. Apothecia (only one present) subplane, 2.1 mm diam., apparently sessile and laminal, margins smooth, coronate (with few bulbs), amphithecia smooth with some bulbate retrorse rhizinae. Disc brown, epruinose, imperforate, epithecium 5.0–12.5 mm high, hymenium 37.5–45.0 μm high, subhymenium 17.5–25.0 μm high. Ascospores rounded to subellipsoid, 5.0–7.5 \times 4.0–5.5 μm , epispore ca. 0.5 μm . Pycnidia not found.

Spot tests. upper cortex K⁺ yellow, UV⁻; medulla K⁺ yellow \rightarrow orange or light red, C⁻, KC⁻, P⁺ yellowish orange, UV⁻.

TLC/HPLC. cortical atranorin, medullary norstictic acid (see also Hale 1976).

Distribution. Asia: India (Sinha and Singh 1986). South America: Argentina (Hale 1976, Calvelo and Liberatore 2002), Paraguay and Brazil: GO, MT, RJ (Hale 1976), PA (Brako et al. 1985), RS (Fleig 1985), SP (Marcelli 1993, Jungbluth 2006), MG (Ribeiro 1998) and PR (Eliasaro 2001).

Comments. The holotype of *B. subcoronata* (Fig. 11) consists merely of four very small fragments, only one being a whole laciniae, with the distal and proximal portions intact. Due to the very poor condition of the specimen it is difficult to describe it accurately, since many of the characters could not be observed. There is only a third of a mature apothecium left, glued to the card voucher. The medulla, which probably was white, is stained with a reddish brown tinge probably due the degeneration of norstictic acid. The hymenium of the single apothecium is brownish and contains few ascospores. Most asci contain only a shapeless mass. It was necessary to totally crush a cross section of the apothecium to observe the highest possible number of ascospores, because almost none emerged from asci when a simple section was put under the microscope (which is a quite common problem in specimens of this genus).

For many years, *Bulbothrix* specimens without vegetative propagation containing medullary norstictic acid with wider laciniae, a brown lower cortex and larger ascospores were identified as *B. subcoronata*. Recently Jungbluth et al. (2008) and Spielmann and Marcelli (2008) proved that they actually belong to different species, *B. regnelliana* and *B. viatica*. Unlike the descriptions found in Hale (1976), Fleig (1985), Marcelli (1993), Ribeiro (1998), Eliasaro (2001), Jungbluth (2006) but in agreement with the original diagnosis (Müller Argoviensis 1887), the ascospores of *B. subcoronata* are very small, being among the smallest in the genus. Müller Argoviensis (1887) described the species separating it from *Parmelia tiliacea* by the shape and color of the laciniae, shape of the apothecium and the small subglobose ascospores “ca. 5 μm long”. Among the 35 ascospores found in good condition, the minimum length was 5 μm and only two slightly exceeded 7.0 μm long. In his remarks, Hale (1976) mentioned that Müller Argoviensis (1887) had cited ascospores with ca. 5 μm long, but that all the specimens he studied had larger ascospores.

In the holotype of *B. subcoronata* the laciniae are sublinear and quite narrow, with subtruncate apices 0.5–1.0 mm wide, while other specimens at first suspected to belong to *B. subcoronata* referred to the species have larger, more subirregular laciniae with subrounded apices, usually 1.0–4.5 mm wide.

Apparently, *B. subcoronata* is a very rare species known only from the type. Since the original description mentions only South America as information for locality, it is impossible to give more precise location information.

Bulbothrix viatica Spielmann & Marcelli can be differentiated by the larger laciniae (1.0–4.5 mm wide) with rounded apices, lower surface with variable colors tending to mixtures of brown with black, common occurrence of laminal ciliary bulbs, and by the larger ascospores (10.0–) 12.0–18.0 × 7.0–10.0 μm.

Bulbothrix regnelliana Jungbluth, Marcelli & Elix can be distinguished by the same characteristics (except that it do not form laminal ciliary bulbs), and by the ascospores 8.0–12.0 × 4.0–8.0 μm. *Bulbothrix ventricosa* (Hale & Kurokawa) Hale can also be differentiated by the same upper and lower cortex and ascospores characteristics of *B. viatica*, and additionally by the cortical maculae and laminal isidia.

***Bulbothrix ventricosa* (Hale & Kurokawa) Hale. Phytologia 28(5): 481. 1974.**

Mycobank: MB 341620

Figures 14–15

Basionym. *Parmelia isidiza* var. *domingensis* Vainio. Annales Academiae Scientiarum Fennicae 6A(7): 17. 1915.

Synonym. *Parmelia ventricosa* Hale & Kurokawa. Contributions from the United States National Herbarium 36: 140. 1964. [nom. nov. for *Parmelia isidiza* var. *domingensis* Vainio]

Lectotype. Dominican Republic, Santo Domingo, La Cumbra, ad corticem arboris, leg. C. Raunkiaer 492, 09-IV-1906 (TUR-V!, duplicate C).

Description. Thallus sublinearly to subirregularly lacinate to sublacinate, tinging dusky green in the herbarium, up to 8.7 cm diam., subcoriaceous to submembranaceous, corticolous or ramulicolous; upper cortex 12.5–15.0 μm thick, algal layer 20.0–32.5 μm thick, medulla 52.5–67.5 μm thick, lower cortex 15.0–22.5 μm thick. Laciniae anisotomically dichotomously branched to irregularly ramified, (0.7–) 1.5–4.5 mm wide, contiguous to occasionally slightly imbricate in the center, weakly adnate and loosely adpressed, with flat to slightly involute, subtruncate to subrounded apices, the margins flat to slightly involute, crenate to subirregular, entire to slightly incised, rarely sublacinulate, axils oval, upper cortex usually continuous to irregularly fissured on older parts, smooth to subrugose, laminal ciliary bulbs common, scarce to abundant, usually frequent, rarely absent, mainly on young distal or less isidiate parts. Adventitious marginal lacinulae scarce on older parts, short, 0.2–0.5 × 0.1–0.2 (–0.3) mm, plane, simple or irregularly branched, apices truncate, lower side concolorous with the lower marginal zone. Maculae weak to distinct, punctiform to effigurate, laminal or in the amphithecia of the apothecia. Cilia black to occasionally whitish, with simple, frequently downward-bent, sometimes missing apices, 0.05–0.35 × ca. 0.03 mm, with emerse bulbate bases 0.05–0.15 (–0.35) mm wide, frequent along the margins in the crenulations and axils of the laciniae, spaced 0.05–0.10 mm from each other, some-

times becoming contiguous, solitary or in small groups, becoming absent or scarce at the apices of the laciniae and some parts of the margins. Soredia and pustulae absent. Isidia frequent to abundant, laminal, granular to short smooth cylindrical, straight, 0.05–0.15 (–0.25) × ca. 0.05 mm, simple to partially slightly ramified, erect, firm to slightly caducous, concolorous but partially with pale e brown apices, eciliate. Medulla white. Lower surface black with small dark brown spots, black mixed with brown in variable intermediary levels to entirely brown, shiny, smooth to rugose, partially venate, moderately rhizinate except by the margins. Marginal zone pale brown to brown or black, attenuate or indistinct from the center, shiny, 0.5–4.0 mm wide, smooth to subrugose, naked becoming rhizinate or papillate towards the center. Rhizinae black to brown, sometimes with whitish apices, simple, partially with bulbate bases, 0.05–0.30 (–0.40) × 0.03–0.05 mm, frequent, evenly distributed. Apothecia subplane to concave, adnate, 0.3–4.2 mm diam., laminal, margins crenate, coronate (bulbs appearing in the crenulations), amphithecium smooth without ornamentations. Disc brown, epruinose, imperforate, epithecium 7.5–10.0 µm high, hymenium 65.0–75.0 µm high, subhymenium 25.0–37.5 µm high. Ascospores ellipsoid to oval, 11.0–20.0 × 7.0–10.0 (–11.5) µm, epispore 1.0–1.5 µm. Pycnidia (not found on type) laminal, immerse, with brown to black ostioles; conidia bacilliform to weakly bifusiform 5.0–7.0 × 1.0 µm.

Spot tests. upper cortex K+ yellow, UV-; medulla K+ yellow→orange or light red, C-, KC-, P+ orange, UV-.

TLC/HPLC. cortical atranorin and chloroatranorin, medullary norstictic and conorstictic acids (examined by Jack A. Elix; see also Hale 1976, Hale and Kurokawa 1964).

Distribution. Asia: Thailand (Papong et al. 2007). Africa: South Africa (Hale 1976, Hale and Kurokawa 1964), Kenya (Swinscow and Krog 1988). North America: Mexico (Hale 1976, Hale and Kurokawa 1964). Central America and Caribbean: Costa Rica, Panama (Hale 1976), Dominican Republic (Vainio 1915, Hale 1976, Hale and Kurokawa 1964). South America: Venezuela (Hale 1976, López-Figueiras 1986, Marcano et al. 1996) and Brazil: Minas Gerais (Ribeiro 1998), São Paulo (Ribeiro 1998, Jungbluth 2006), Pará (Brako et al. 1985) and Paraná (Eliasaro 2001, Eliasaro and Adler 1997).

Additional specimens examined. Mexico, open pasture, scattered cactus and Acacia, elev. 1240 m, 9 km E of Jalapa, along highway 140, on *Opuntia* sp., leg. M.E.Hale & T.R.Soderstrom 19389, 13-III-1960 (DUKE). Dominican Republic, La Vega, 4.7 km S of Constanza, then 8 km toward Pinar Parejo, moist broadleaf forest along road, 6150 ft., leg. R. C. Harris 14784E, 27-IV-1982 (NY). Venezuela, Táchira, Vía Rubio, Bramón, 800–1100 m, leg. M. E. Hale & M. López-Figueiras 45727a, 24-III-1975 (US). Bolivia, Santa Cruz, Florida, Santa Rosa de Lima, Quebrada Del Crestón, 5 km E of Santa Rosa, 17°52'S, 64°15'W, 1470m, leg. M. Salidas et al. 4370b, 3-VII-1996 (NY). Uruguay, Rocha, La Esmeralda (route 9, 280.5 km), on *Acacia* sp., 34°12'S, 53°52'W, 800–1100 m, leg. A. Mones s.n., 25-V-1986 (US). Brazil, Pará State, Serra do Cachimbo, 842 km N of Cuiabá on Cuiabá-Santarém highway (BR-163), ca. 8°45'S, 54°57'W, ca. 350–500 m, mature Forest along stream on sandy soil with deep humus and roadbank vegetation, 5-V-1983, leg. L. Brako & M.J. Dibben 6711 (NY). Idem, Bahia State, Serra de Rega, on bark of small vochyosiaceous tree in

cerrado, cerrado with occasional tree islands, ca. 23 km N of Seabra, road to Agua de Rega, elev. ca. 1000 m, leg. H.S. Irwin, R.M. Harley & G.L. Smith s.n., 24-II-1971 (NY 30946J). Idem, Minas Gerais State, Catas Altas Municipality, Parque Natural do Caraça, track to the Cascatinha, first 200 m, on small tree thin twig in mesophyllous wood, leg. M.P. Marcelli & A.E. Luchi 29789, 12-XI-1995 (SP). Idem, São Paulo State, Ibiúna Municipality, Morro Grande Neighborhood, SKY site, on small tree thin twig (*Citrus* sp.) in orchard, leg. M.P. Marcelli & O. Yano 14618, 12-X-1992 (SP). Idem, Serra Negra Municipality, Alto da Serra, near the television tower, on isolate coconut tree stem in the hotel, leg. M.P. Marcelli, O. Yano & A.B. Carvalho 22480, 04-IV-1993 (SP). Idem, São Paulo Municipality, Parque Estadual da Cantareira, Núcleo da Pedra Grande, on tree trunk in illuminated woods, leg. M.P. Marcelli, A. Rezende & O. Yano 13607, 18-V-1992 (SP). Idem, Santa Catarina State, Serra Geral, Serra Rio do Rastro, ca. 12 km W of Bom Jardim da Serra on road to Lauro Muller, at rim of summit plateau, 1470 m ca. 28°22'S, 49°32'W, humid hardwoods, 27-IX-1984, leg. D.M.Vital & W.R.Buck 12370 p.p. (NY). Idem, Rio Grande do Sul State, Vacaria Municipality, Fazenda da Estrela, 28°03'46.8"S, 50°57'33.7"W, 876 m alt., on branch of *Podocarpus lambertii* in edge of riparian wood, leg. L.S. Canêz & A.A. Spielmann 1282, 10-I-2004 (SP).

Comments: The holotype (Fig. 14) consists of a small thallus in good condition, growing on a sliver of bark, indicating that the lower surface has never been examined yet. The lower cortex is difficult to see without removing the thallus from the substrate, but it is apparently black at the margins and dark brown otherwise. The type has only one mature apothecium with crenate margins containing ciliary bulbs. This kind of ciliary bulbs occurs also on other thallus parts. The amphithecium is maculate and has no isidia. The isotype in C mentioned by Hale (1976) was not found by the curator of that herbarium.

One of the most distinguishing characteristics of this species are the laminal ciliary bulbs, present in variable amounts (found in almost all thalli examined). These bulbs may appear all over the lamina, most often on young parts or those devoid of isidia, being bright and having an identical size and anatomy compared to those of the marginal cilia. Except in rare cases, they usually do not show formation of apices, much like those in the margins of the amphithecia. They are more massive and opaque than the pycnidia, which tend to have opaque brown or black ostioles, and are immersed in the thallus.

All bulbs have the same oily substance and idioblasts cells (Hale 1975, Feuerer and Marth 1997, Benati 2011), whether they are marginal, laminal or those that form the coronation of apothecia. No true pycnidia were found in the holotype.

In contrast to earlier publications (e.g., Hale 1976), the color of the lower surface was found to be not constantly black, but variable among specimens of *B. ventricosa*. It ranges from almost completely black to entirely brown, or to variable in color: (a) a brown to pale brown center with brown to dark brown margins, (b) a brown to dark brown center with dark brown margins, (c) a brown to black center with dark brown margins, (d) a brown to black center with pale brown margins, (e) a black to dark brown center with pale brown margins and (f) a black center with pale brown margins.

Small specimens apparently tend to have an almost black lower surface, with dark brown margins and occasional few parts in the center, with a tendency to lighten as the thallus expands and develops. The margins of the lower cortex are initially distinct and lighter than the center until the brown color predominates on the lower surface, which usually occurs in some of the larger and older thalli.

Even with this tendency for variation apparently linked to thallus development, some developed thalli were found with a predominantly black to dark brown lower cortex, as well as some small thalli with a predominantly brown to pale brown lower cortex.

Apparently, Eliasaro (2001) was the only author to perceive the occurrence of different colors in the lower cortex, citing specimens with a variation from dark brown to black.

The discovery of the laminal bulbs and the constant citation of a black lower surface in the literature (Hale and Kurokawa 1964, Hale 1976) originally led to the hypothesis that there was a new undescribed species close to *B. ventricosa*, but the laminal bulbs and the variable colour of the lower cortex appeared to be characteristic for the species.

Bulbothrix ventricosa can be misidentified as *B. tabacina* when the lower cortex is black or as *B. isidiza* when it is more brownish. The three species are morphologically close and have similar spot test reactions (see differences below). Also *Relicina abstrusa* (Vainio) Hale has been confused with these, probably by the presence of a black lower surface, isidia, and medullary norstictic acid. *Relicina abstrusa* has, however, a yellowish upper cortex due to the presence of usnic acid, while the cilia have smaller bulbs in comparison to those of *B. ventricosa* and are more evenly spaced and distributed along the margins. The ascospores are also smaller and rounded, $5.0\text{--}6.0 \times 4.0\text{--}5.0 \mu\text{m}$.

Vainio (1915), in describing *B. ventricosa* as *Parmelia isidiza* var. *domingensis*, believed it to be a variety of *P. isidiza* Nylander [*Bulbothrix isidiza* (Nylander) Hale], which curiously has a brown lower surface, and whose medulla (which contains salazinic acid instead of norstictic) reacts similarly to the K test. He noted the apothecia “without pycnidia adorning its margins” (absence of the bulbs that form the corona), and the laminal ciliary bulbs, but understood them as pycnidia, stating that he did not find conidia.

Because the name *Parmelia domingensis* was already used by Acharius (1814) for a species of *Anaptychia* [= *Heterodermia domingensis* (Acharius) Trevisan], Hale and Kurokawa (1964) proposed a new name and a new status for the taxon. The authors mentioned that *P. ventricosa* would be a Caribbean species with a disjoint locality in southern Africa, while *P. isidiza* would be a typically African species.

Bulbothrix tabacina (Montagne & Bosch) Hale differs from *B. ventricosa* by the constantly black and shiny coloration of the lower cortex, the ecoronate apothecia and by the medullary chemistry due the presence of salazinic acid. *Bulbothrix isidiza* differs similar to *B. tabacina*, but has a overall brown lower cortex. Thalli of these species do not form laminal ciliary bulbs.

Bulbothrix cassa Jungbluth, Marcelli & Elix is morphologically similar to *B. ventricosa*, but does not form laminal ciliary bulbs and its isidia are frequently ornamented

with pycnidia. *Bulbothrix cassa* has a uniformly black lower cortex from the center to the margins, and by not forming any medullary substances (all spot tests negative).

***Bulbothrix viatica* Spielmann & Marcelli. Mycotaxon 103: 201. 2008.**

Mycobank: MB 511147

Figures 16–17

Synonym. *Bulbothrix megapotamica* Canêz & Marcelli. Mycotaxon 105: 225. 2008.

Holotype. Brazil, Rio Grande do Sul State, Santa Cruz do Sul Municipality, margin of the highway RST-287, km 102, 29°41'03.3"S, 52°25'33.6"W, 150 m alt., roadside, on Eucalyptus branch, 28-VII- 2003, leg. A.A. Spielmann 389 (SP!).

Description. Thallus sublinearly or subirregularly laciniate to sublaciniate, turning dusky green in the herbarium, fragments up to 5.3 cm diam., subcoriaceous to submembranaceous, corticolous or ramulicolous; upper cortex 7.5–15.0 μm thick, algal layer 25.0–37.5 μm thick, medulla 37.5–72.5 μm thick, lower cortex 12.5–25.0 μm thick. Laciniae anisotomically dichotomously to irregularly branched, (0.4–) 1.1–4.7 mm wide, contiguous to sometimes slightly imbricate or rarely crowded in the center, adnate and loosely adpressed, with flat to slightly involute or revolute, subtruncate to subrotund apices, the margins flat to slightly involute, sinuous to crenate or subirregular, entire to slightly incised, rarely sublacinate, axils oval to irregular, upper cortex continuous with irregular fissures in old parts, smooth to subrugose, laminal ciliary bulbs common, absent to abundant, usually frequent, mainly on young distal parts. Adventitious marginal lacinulae scarce on older parts, short, 0.2–1.2 \times 0.1–0.4 mm, flat, simple to furcate or irregularly branched, apices subtruncate, lower side concolorous with the lower marginal zone. Maculae absent. Cilia black, with usually simple, sometimes double or absent, frequently downward-bent apices, 0.05–0.35 (–0.60) \times ca. 0.03 mm, with emerse bulbate bases 0.05–0.15 (–0.35) mm wide, frequent along the margins in the crenulations and axils of the laciniae, spaced 0.05–0.10 mm from each other, occasionally becoming contiguous, solitary or in small groups, absent or scarce at the apices of the laciniae and in some parts of the margins. Soredia, pustulae and isidia absent. Medulla white. Lower surface brown to dark brown, sometimes blackened in some small parts [black, mottled with brown in variable intermediary levels to completely brown], opaque to shiny, smooth to rugose, moderately rhizinate except at the margins. Marginal zone brown to pale brown, black or variegate, attenuated or indistinct from the center, shiny, 0.5–4.0 mm wide, smooth to subrugose or subvenate, papillate, becoming rhizinate towards the center. Rhizinae black to dark or pale brown, occasionally with whitish apices, simple or rare irregularly branched, partially with bulbate bases, 0.10–0.50 (–0.80) \times 0.03–0.05 mm, frequent but sometimes becoming more abundant at some spots, evenly distributed. Apothecia subconcave to concave or urceolate, occasionally subplane, adnate to substipitate, 0.5–5.4 mm diam., laminal, margins smooth to crenate, coronate (bulbs appearing in the crenulations), amphithecium smooth

to rugose without ornamentations. Disc brown to pale brown, epruinose, imperforate, epithecium 7.5–12.5 μm high, hymenium 55.0–75.0 μm high, subhymenium 12.5–27.5 μm high. Ascospores ellipsoid to oval, (10.0–) 12.0–16.0 (–18.0) \times (6.0–) 7.0–10.0 (–11.0) μm , epispore 1.0–1.5 μm . Pycnidia frequent, submarginal to laminal, immerse, with brown or black ostioles; conidia weakly to distinctly bifusiform (4.0–) 5.0–7.5 \times 1.0 μm .

Spot tests. upper cortex K⁺ yellow, UV⁻; medulla K⁺ yellow \rightarrow orange or light red, C⁻, KC⁻, P⁺ orange, UV⁻.

TLC/HPLC. cortical atranorin, medullary norstictic and connorstictic acids (see also Spielmann 2005, Spielmann and Marcelli 2008).

Distribution. South America. Brazil: Rio Grande do Sul (Canêz 2005, Spielmann 2005, Marcelli and Canêz 2008, Spielmann and Marcelli 2008) and São Paulo (Jungbluth 2006). Here is cited for the Brazilian States of Goiás, Minas Gerais, and Rio de Janeiro.

Additional specimens examined. Brazil, Goiás State, Serra Geral do Paran , on bark of *Kielmeyera*, in cerrado, cerrado and campo on slopes, ca. 1 km S of S o Jo o Alian a, ca. 850 m, leg. Irwin et al. 31977a, 16-III-1971 (NY). Idem, ca. 10 km S of S o Jo o da Alian a, campo e cerrado, cerrado, on trunk of small tree (*Hymenaea* sp.), 950 m, leg. H. S. Irwin, R. M. Harley & G. L. Smith 32074, 17-III-1971 (US). Idem, Minas Gerais State, Catas Altas Municipality, Serra do Cara a, Parque Natural do Cara a, , on tree trunk at the foot of the Morro do Calv rio at the side of the hotel, leg. M.P. Marcelli & A.E. Luchi 29654, 10-XI-1995 (SP). Idem, Rio de Janeiro State, leg. A. Glaziou 1825 (UPS). Idem, S o Paulo State, Santa Rita do Passa Quatro Municipality, Vassununga farm, Anhanguera Highway km 259, on thin small tree thin twig in the dense cerrado, leg. M.P. Marcelli & C.H. Ribeiro 17508, 15-VI-1979 (SP). Idem, Rio Grande do Sul State, Sinimbu Municipality, Cava Funda, 29 27'40"S, 52 31'09.5"W, corticolous, in the embankment of the road in open place, leg. A.A. Spielmann & L.S. Can z 1318, 05-I-2004 (SP). Idem, Herveiras Municipality, 29 27'12.5"S, 52 37'57.7"W, 540 m alt., in trunk of *Eucalyptus* sp., in the embankment of the road in open place, leg. A.A. Spielmann, L.S. Can z & C. Trentin 714, 24-I-2004 (SP). Idem, Sobradinho Municipality, margin of RST-481 road, near the road clover, 29 24'20.2"S, 52 01'25.9"W, 375 m alt., corticolous in bush in the embankment in open place, leg. A.A. Spielmann 341, 17-VII-2003 (SP). Idem, Vacaria Municipality, Fazenda da Estrela, 28 04'58.9"S, 50 56'48.9"W, 850 m alt., open field, on a shrub branch, 23-II-2003, leg. L.S. Can z & A.A. Spielmann 146 (holotype of *B. megapotamica*, SP!).

Comments. The holotype (Fig. 16) is a small fragmented piece in excellent condition, free of substrate, with a predominantly brown lower surface. The upper surface contains many laminal bulbs and pycnidia, and several well-developed apothecia, containing mature ascospores.

Bulbothrix viatica is probably the parental non-isidiate morph of *B. ventricosa*. Both are very similar in almost all characteristics (especially regarding the color variation of the lower cortex and the frequent presence of laminal ciliary bulbs), differing almost only by the presence of cortical maculae and isidia in *B. ventricosa*.

The same color variations found in the lower cortex of specimens of *B. viatica* were also found in specimens of *B. ventricosa* (see there). The most common is different tinges of brown mixed with dark or blackish spots of variable sizes (as in the holotype), but some thalli, especially the smaller ones, tend to have a darker or black coloration.

The laminal ciliary bulbs were overlooked by Spielmann and Marcelli (2008). They are clearly present in part of the material cited by these authors, including the holotype. Admittedly, specimens without laminal bulbs do also occur and are more common in *B. viatica* than in *B. ventricosa*. The structure of the laminal bulbs is the same as in *B. ventricosa* (see above). The eventual appearance of these bulbs in these species might be conditioned to thallus development and environmental stimuli.

As shown by Marcelli and Canêz (2008), there are at least three morphologically similar species, with norstictic acid and simple cilia with globose bulbate bases, common in the southern and southeastern regions of Brazil which formerly included in *B. subcoronata*. They are differentiated by the size of the ascospores, the presence or absence of laminal ciliary bulbs and the coloration of the lower cortex. The ones currently known are *B. regnelliana*, *B. ventricosa* and *B. viatica* and possibly true *B. subcoronata*. The specimens with a brown lower surface with ascospores 7–11 µm long reported by Hale (1976) as *B. subcoronata* are possibly *B. regnelliana*, while the specimens with ascospores (10–) 12–18 (–20) µm long and a black or brown lower surface cited in other works might be *B. viatica*.

Accordingly to the literature, *B. subcoronata* (Müller Argoviensis) Hale is the species most easily confusable with *B. viatica*, but it has narrower and more sublinear laciniae (ca. 0.5–1.0 mm wide), no laminal ciliary bulbs, a black lower cortex with distinct brown margins, and retrorse rhizinae on the apothecia. The ascospores are smaller, more rounded (5.0–7.5 × 4.0–5.5 µm) than described by Müller Argoviensis (1887).

The holotype of *B. megapotamica* Canêz & Marcelli has narrow and truncate laciniae (0.5–1.5 mm wide), lacks laminal ciliary bulbs (with many pycnidia), and a black lower surface with brown margins, and almost no formation of bulbs in the rhizinae (the few seen are subtle). However, there are specimens with intermediary characteristics who show that *B. megapotamica* is a synonym of *B. viatica*.

Bulbothrix hypocraea (Vainio) Hale differs from *B. viatica* by the absence of ciliary bulbs on a maculate upper cortex, a predominantly ochraceously or creamy pale brown lower surface, creamy or pale brown rhizinae, ecoronate apothecia with ascospores 8.0–14.0 × 6.0–8.0 µm and the presence of medullary salazinic acid. The similar *Bulbothrix continua* (Lyngé) Hale is also emaculate, but has narrower (ca. 1.0–2.0 mm wide) and dichotomous sublinear laciniae and contains salazinic acid in the medulla.

Bulbothrix linteolocarpa Marcelli differs by the very narrow, sublinear laciniae (ca. 0.3–0.5 mm wide), a pale brown lower cortex with darker margins, simple to furcate or irregularly branched rhizinae, ecoronate flat apothecia stretched over the laciniae, and salazinic acid in the medulla.

Bulbothrix setschwanensis (Zahlbruckner) Hale differs by having a pale brown lower surface with indistinct margins, rhizinae without basal bulbs, ecoronate apothecia containing ascospores 12.0–19.0 × 6.0–9.0 µm, and medullary salazinic acid.

Bulbothrix meizospora (Nylander) Hale differs by the larger laciniae (1.5–6.0 mm wide), a shiny black lower surface with distinct brown margins, ecoronate apothecia with larger ascospores (12.0–20.0 × 8.0–12.0 µm), and medullary salazinic acid. *Bulbothrix sensibilis* (Steiner & Zahlbruckner) Hale differs by almost the same characteristics, but has smaller ascospores, 7.0–11.0 × 5.0–7.0 µm.

Acknowledgements

The author wishes to thank the curators of B (Robert Vogt), BM (Scott LaGrecca), CANB (Brendan Lepschi), DUKE (Kathleen Pryer), G (Philippe Clerc), ICN (Mara Rejane Ritter), NY (Barbara Thiers), TUR (Seppo Huhtinen), UPS (Stefan Ekman), US (Rusty Russell) and Dr. Klaus Kalb for the loan of the type specimens and additional material, Dr. Jack A. Elix for HPLC data on the species substances, Dr. Michaela Schnull and Genevieve Lewis-Gentry for the English review, comments, and suggestions, Dr. Luciana Canêz for the discussions about morphological characters found in *B. cinerea* and the reviewers for critical revision of the manuscript.

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Translation into French of: “Changes to publication requirements made at the XVIII International Botanical Congress in Melbourne – what does e-publication mean for you?” – Translated by Christian Feuillet and Valéry Malécot

Changements des conditions requises pour la publication faite au XVIII^e Congrès International de Botanique à Melbourne – qu’est-ce que la publication électronique représente pour vous ?

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Received 4 October 2011 | Accepted 4 October 2011 | Published 5 March 2012

Citation: Knapp S, McNeill J, Turland NJ (2012) Translation into French of: “Changes to publication requirements made at the XVIII International Botanical Congress in Melbourne – what does e-publication mean for you?”. Translated by Christian Feuillet and Valéry Malécot. MycoKeys 2: 29–36. doi: 10.3897/mycokeys.2.2196

Résumé

Les changements au *Code International de Nomenclature Botanique* sont décidés tous les 6 ans aux Sections de Nomenclature associées aux Congrès Internationaux de Botanique (CIB). Le XVIII^e CIB se tenait à Melbourne, Australie; la Section de Nomenclature s’est réunie les 18–22 juillet 2011 et ses décisions ont été acceptées par le Congrès en session plénière le 30 juillet. Suite à cette réunion, plusieurs modifications importantes ont été apportées au *Code* et vont affecter la publication de nouveaux noms. Deux de ces changements prendront effet le 1^{er} janvier 2012, quelques mois avant que le *Code de Melbourne* soit

publié. Les documents électroniques publiés en ligne en ‘Portable Document Format’ (PDF) avec un ‘International Standard Serial Number’ (ISSN) ou un ‘International Standard Book Number’ (ISBN) constitueront une publication effective, et l’exigence d’une description ou d’une diagnose en latin pour les noms des nouveaux taxa sera changée en l’exigence d’une description ou d’une diagnose en latin ou en anglais. De plus, à partir du 1^{er} janvier 2013, les noms nouveaux des organismes traités comme champignons devront, pour que la publication soit valide, inclure dans le protologue (tous ce qui est associé au nom au moment de la publication valide) la citation d’un identifiant (‘identifier’) fourni par un dépôt reconnu (tel MycoBank). Une ébauche des nouveaux articles concernant la publication électronique est fournie et des conseils de bon usage sont esquissés.

Pour encourager la diffusion des changements adoptés au Code International de Nomenclature pour les algues, les champignons et les plantes, cet article sera publié dans *BMC Evolutionary Biology*, *Botanical Journal of the Linnean Society*, *Brittonia*, *Cladistics*, *MycoKeys*, *Mycotaxon*, *New Phytologist*, *North American Fungi*, *Novon*, *Opuscula Philolichenum*, *PhytoKeys*, *Phytoneuron*, *Phytotaxa*, *Plant Diversity and Resources*, *Systematic Botany* et *Taxon*.

Introduction

En juillet 2011, durant le XVIII^e Congrès International de Botanique à Melbourne, Australie, deux modifications importantes ont été apportées au *Code International de Nomenclature Botanique* (maintenant appelé *Code International de Nomenclature pour les Algues, les Champignons et les Plantes*) qui prendront effet au 1^{er} janvier 2012. Ces changements affecteront toutes les personnes qui publieront des noms régis par ce *Code*. Comme le *Code de Melbourne* ne sera pas publié avant mi-2012, nous avons pensé qu’il serait utile de donner les grandes lignes de ces modifications, en particulier celles concernant la publication effective sur supports électroniques (dans les Articles 29, 30 et 31). Pour un rapport concis sur tous les changements au *Code* acceptés à Melbourne, voyez McNeill et al. (2011).

Une ébauche des Articles, Notes et Recommandations traitant de publication effective est fournie pour aider les rédacteurs et les éditeurs à établir les meilleures pratiques pour mettre en œuvre cette partie du *Code*. Nous précisons aussi ici ce que ces modifications *ne* signifient *pas*, pour guider ceux qui souhaitent publier des noms nouveaux et des typifications sur supports électroniques. Nous conseillons aux lecteurs de consulter le rapport du Comité Spécial sur la Publication Électronique accompagnant les changements proposés avant le Congrès (Chapman et al. 2010), où les raisons des changements maintenant acceptés dans le *Code* sont présentées.

Canevas des Articles 29, 30 et 31, et des Recommandations 29A, 30A et 31A modifiés

Ici nous reproduisons le texte de tous les Articles, Notes et Recommandations pertinents (sauf les exemples), avec les changements surlignés en **gras**. La rédaction est ici provisoire, dans l’attente de la réunion du Comité Éditorial en décembre 2011 pour finaliser la version imprimée du *Code de Melbourne*.

Article 29

29.1. Une publication n'est effective, aux termes de ce *Code*, que par la distribution de documents imprimés (par vente, échange ou don) au public en général ou, au minimum, à des institutions botaniques dont les bibliothèques sont accessibles aux botanistes en général. **Une publication est aussi effective par distribution par voie électronique de matériel en 'Portable Document Format' (PDF; voir aussi l'Art. 29.3 et la Rec. 29A.1) dans une publication en ligne avec un 'International Standard Serial Number' (ISSN) ou un 'International Standard Book Number' (ISBN).** Une publication n'est pas effective par la communication de noms nouveaux dans une réunion publique, par l'apposition de noms dans des collections ou des jardins ouverts au public, par l'édition de microfilms reproduisant des textes manuscrits ou dactylographiés ou tout autre matériel non publié, ou par une distribution électronique **autre que celles décrites ci-dessus.**

29.2. Dans le cadre de cet Article, 'en ligne' est défini comme accessible électroniquement sur le 'World Wide Web'.

29.3. Si le 'Portable Document Format' (PDF) devenait obsolète, un format standard international successeur communiqué par le Comité Général (voir Div. III) est acceptable.

29.4. Le contenu d'une publication électronique particulière ne doit pas être altéré après sa première parution. Aucune de ces altérations n'est elle-même effectivement publiée. Des corrections ou des révisions doivent paraître séparément pour être effectivement publiées.

Recommandation 29A

[La Recommandation existante est remplacée par ce qui suit:]

29A.1. Une publication électronique au 'Portable Document Format' (PDF) devrait se conformer au standard d'archivage PDF/A (ISO 19005).

29A.2. Les auteurs devraient, en préférence, publier dans des publications qui sont archivées, autant que possible en conformité avec les critères suivants (voir aussi la Rec. 29A.1) :

(a) Le matériel devrait être déposé dans plusieurs dépôts électroniques en ligne réputés, c'est dire un dépôt certifié ISO ;

(b) Les dépôts électroniques devraient être dans plus d'une région géographique du monde et de préférence sur des continents différents ;

(c) Le placement de copies imprimées dans des bibliothèques dans plus d'une région géographique du monde et de préférence sur des continents différents est également recommandé.

Article 30

30.1. La publication par diffusion de matériel électronique ne constitue pas une publication effective avant le 1^{er} janvier 2012.

30.2. Les publications électroniques ne sont pas effectives si il y a dans, ou associée à, la publication une preuve que la publication est seulement une version préliminaire qui a été, ou doit être, remplacée par une version que l'éditeur considère comme finale, auquel cas seule cette version finale est effectivement publiée.

30.3. La publication, avant le 1^{er} janvier 1953, par autographie indélébile est effective. Une autographie indélébile publiée à une date ultérieure n'est pas effectivement publiée.

30.4. Dans le cadre de cet Article, une autographie indélébile est un document manuscrit reproduit par un processus mécanique ou graphique (tel que la lithographie, l'offset ou la gravure sur métal).

30.5. La publication au ou à partir du 1^{er} janvier 1953, dans les catalogues commerciaux ou les journaux d'information non scientifique, et au ou à partir du 1^{er} janvier 1973, dans les listes d'échange de graines, ne constitue pas une publication effective.

30.6. La distribution, au ou à partir du 1^{er} janvier 1953, de document imprimé accompagnant des exsiccata ne constitue pas une publication effective.

Note 1. Si le document imprimé est également distribué indépendamment des exsiccata, il est effectivement publié.

30.7. La publication, au ou à partir du 1^{er} janvier 1953, d'un travail indépendant isolé dit être une thèse soumise à une université ou un autre établissement d'enseignement dans le but d'obtenir un diplôme n'est pas effectivement publié à moins qu'il contienne une déclaration explicite (faisant référence aux dispositions du *Code* pour une publication effective) ou une autre preuve interne qu'il est considéré comme une publication effective par son auteur ou éditeur.

Note 2. La présence d'un 'International Standard Book Number' (ISBN) ou la mention d'un nom d'imprimeur, d'éditeur ou de distributeur dans la version imprimée originale est considérée comme une évidence interne que ce travail était destiné à être effectivement publié.

Recommandation 30A

30A.1. Les versions préliminaire ou finale d'une même publication électronique devraient être clairement indiquées comme telles au moment de leur première parution.

30A.2. Il est vivement recommandé aux auteurs d'éviter de publier de nouveaux noms et des descriptions ou diagnoses de nouveaux taxons dans un document imprimé éphémère de n'importe quel type, notamment dans un document imprimé qui est multiplié en nombre limité et incertain, dont la persistance du texte peut être limitée, dont la publication effective du point de vue du nombre d'exemplaires n'est pas évidente, ou qui n'ont guère de chance d'atteindre le public. Les auteurs devraient aussi éviter de publier des noms nouveaux et des descriptions

ou diagnoses dans des périodiques populaires, dans des périodiques de documentation (« abstracting journals ») ou sur des feuilles d'errata.

30A.3. Pour favoriser la disponibilité dans le temps et l'espace, les auteurs publiant des nouveautés nomenclaturales devraient donner la préférence aux périodiques qui publient régulièrement des articles taxinomiques. **Autrement, une copie d'une publication (qu'elle soit publiée sous forme imprimée ou électronique) devrait être envoyée au(x) centre(s) d'indexation approprié(s) pour le groupe taxonomique, et les publications qui existent seulement sous forme imprimée** devraient être déposées dans au moins dix - mais de préférence plus - bibliothèques botaniques ou des bibliothèques généralement accessibles à travers le monde.

30A.4. Les auteurs et les rédacteurs sont encouragés à mentionner les nouveautés nomenclaturales dans le sommaire ou le résumé, ou à les lister dans un index dans la publication.

Article 31

31.1. La date de publication effective est la date à laquelle le document imprimé **ou électronique** devient disponible ainsi que définit dans les Art. 29 et 30. En l'absence de preuve établissant une autre date, celle qui figure sur le matériel imprimé **ou électronique** lui-même doit être acceptée comme correcte.

[La Note 1 existante est remplacée par ce qui suit :]

31.2. Quand une publication paraît en parallèle en versions électronique et imprimée, celles-ci doivent être traitées comme publiées effectivement à la même date, à moins que les dates des versions soient différentes au sens de l'Art. 31.1.

31.3. Lorsque les tirés-à-part de périodiques ou d'autres ouvrages mis en vente sont distribués à l'avance, la date sur le tirés-à-part est acceptée comme la date de publication effective, à moins qu'il y ait une preuve qu'elle est erronée.

Recommandation 31A

31A.1. La date à laquelle l'éditeur ou son agent remet le document imprimé à l'un des transporteurs usuels pour la distribution au public devrait être acceptée comme sa date de publication effective.

Bon usage

Les auteurs de noms nouveaux, rédacteurs et éditeurs auraient intérêt à s'assurer que les publications comprenant des noms nouveaux sont en accord avec le *Code de Melbourne*,

pour que ces noms soient effectivement publiés. Nous suggérons que ceux qui publient dans des journaux ou des séries monographiques et des livres qui ont des éditions en ligne communiquent avec les éditeurs pour qu'un bon usage puisse être établi dans la communauté aussi vite que possible. De nombreux éditeurs ont été attentifs depuis quelques années aux problèmes liés à la publication électronique ('e-publication') des nouveautés taxonomiques (cf. Knapp & Wright 2010; guidelines in PLoS One [<http://www.plosone.org/static/policies.action#taxon>]) et un intérêt considérable pour rendre fonctionnelles les modifications de ce nouveau *Code* a été apparent.

Certaines pratiques, dont nous pensons qu'elles aideront les étapes initiales de l'e-publication de nouveautés faits en accord avec le *Code de Melbourne*, sont les suivantes :

- Avoir dans chaque article la date de publication en position évidente (comme c'est le cas de nombreux journaux, par exemple *New Phytologist* ou *Nature*).
- Si une version mise en ligne en avance paraît, et qu'elle n'est pas la même que la version finale (et donc qu'elle n'est pas le lieu d'une publication effective), estampillez de manière évidente chaque article avec la mention de cet état de fait (par exemple *American Journal of Botany*).
- Afficher de manière évidente les ISSN ou ISBN de la publication sur chaque article aidera les indexeurs à établir que la publication est effective.
- Publier dans des journaux (ou des séries monographiques) qui participent au système CLOCKSS (cf. Knapp & Wright 2010 pour une description) ou un autre système international d'archivage et de préservation assurera un archivage à long terme.
- Les auteurs de nom nouveau sur support électronique devraient alerter les centres d'indexation appropriés comme recommandé par la Rec. 30A.3 - cela aidera les indexeurs qui pourraient autrement ne pas être au courant de noms publiés électroniquement.

Ce que ces changements ne signifient pas

Bien que les nouveaux Articles et Recommandations utilisent les termes PDF et PDF/A, cela ne veut pas dire que les publications doivent paraître *seulement* dans ce format pour être effectivement publiées. Par exemple, certains journaux en ligne font paraître des articles au format Hypertext Markup Language (HTML) avec une version parallèle PDF. Dans ce cas, la version PDF sera effectivement publiée. La mention disant que le Comité Général pour la Nomenclature Botanique communiquera les nouveaux standards internationaux acceptables, si le PDF devenait obsolète, signifie que les auteurs de nouveaux noms et la communauté des utilisateurs du *Code* pourront rester informés des développements dans cette discipline et que le *Code* sera protégé de l'obsolescence.

L'utilisation des supports suivants pour la publication électronique ne résultera pas en une publication effective des noms nouveaux d'après le *Code de Melbourne* :

- La publication sur des sites web ou dans des documents éphémères disponibles sur Internet (il y a des critères stricts pour attribuer des ISSN [<http://www.issn.org>]).

- La publication dans des journaux sans un ISSN ou e-ISSN enregistré.
- La publication dans des livres sans un ISBN or e-ISBN enregistré.

La Recommandation adoptée de conseiller le dépôt d'une copie imprimée de chaque e-publication dans une bibliothèque suggère une action aux botanistes, mais elle n'établit pas une pratique standard ou un protocole à suivre pour les bibliothécaires. Les bibliothécaires sont eux-mêmes dans une phase de transition complexe entre des modalités de publication (Johnson & Luther 2007), et les botanistes pourraient trouver les bibliothécaires réticents ou incapables d'accepter des articles séparés imprimés en accessions individuelles si le volume en est important.

Deux autres modifications importantes dans le Code concernant la publication des noms

Le second changement au *Code* adopté à Melbourne pour prendre effet à partir du 1^{er} janvier 2012 est que la description ou la diagnose requise pour une publication valide du nom d'un nouveau taxon pour tous les organismes régis par le *Code* peut être soit en anglais soit en latin. C'est la règle actuelle pour les noms de fossiles végétaux, mais tous les nouveaux taxa non-fossiles requéraient une description ou une diagnose en latin (champignons et plantes depuis le 1^{er} janvier 1935; algues [y compris les cyanobactéries, si traitées sous le *Code*] depuis le 1^{er} janvier 1958). Cela n'a aucune influence sur la forme des noms scientifiques, qui continuent d'être latins ou réputés latins. Les exigences de chaque journal vis à vis du latin et/ou de l'anglais seront, bien sûr, déterminées par le rédacteur de chaque journal.

Un troisième changement au *Code* adopté à Melbourne au sujet de la publication des noms, qui ne prendra effet que le 1^{er} janvier 2013 (pas le 1^{er} janvier 2012 comme déclaré par Miller et al. 2011), énonce que tous les noms d'organismes traités comme des champignons doivent, comme condition supplémentaire pour une publication valide, inclure dans le protologue (tous ce qui est associé au nom au moment de la publication valide) la citation d'un identifiant fourni par un dépôt reconnu (tel que MycoBank [<http://www.mycobank.org/>]). Cela sera rendu public par ailleurs.

L'exigence d'un identifiant unique pour les nouveaux noms de champignon à partir du 1^{er} janvier 2013 *ne s'applique pas* aux plantes ou aux algues; il n'y a pas besoin pour les auteurs de nouveaux noms dans ces groupes de demander des 'Life Science Identifiers' (LSIDs) - ou d'autres identifiants - aux centres d'indexation.

Remerciements

SK est appuyé par le programme de la NSF Planetary Biodiversity Inventory (DEB-0316614, 'PBI Solanum - a worldwide treatment'). La participation de JMcN et de NJT à la Section de Nomenclature du XVIII^e CIB à Melbourne a été supportée en

partie par l'International Association for Plant Taxonomy (IAPT). Nous remercions Katherine Challis (Kew) pour ses commentaires utiles.

Pour encourager la dissémination des modifications apportées au Code International de Nomenclature pour les algues, les champignons et les plantes, cet article sera publié dans *BMC Evolutionary Biology*, *Botanical Journal of the Linnean Society*, *Brittonia*, *Cladistics*, *MycKeys*, *Mycotaxon*, *New Phytologist*, *North American Fungi*, *Novon*, *Opuscula Philolichenum*, *PhytoKeys*, *Phytoneuron*, *Phytotaxa*, *Plant Diversity and Resources*, *Systematic Botany* et *Taxon*.

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- [À notre connaissance, il n'y a pas de traduction française du Code de Vienne 2006 ; les traductions proposées ci-dessus pour des portions non modifiées des articles du Code de Vienne sont pour la plupart inédites et respectent à la lettre le texte de 2006 et non pas celui de 2000.]

Translation into Turkish of: “Changes to publication requirements made at the XVIII International Botanical Congress in Melbourne – what does e-publication mean for you?”. Translated by Ali A. Dönmez, Yusuf Menemen and Zübeyde Uğurlu

Onsekizinci (XVIII) Uluslararası Botanik Kongresi'nde (Melbourne) Yayın ile İlgili Gereklilikler Konusunda Yapılan Değişiklikler; e-yayın size ne ifade ediyor”

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Received 1 December 2011 | Accepted 1 December 2011 | Published 5 March 2012

Citation: Knapp S, McNeill J, Turland NJ (2012) Translation into Turkish of: “Changes to publication requirements made at the XVIII International Botanical Congress in Melbourne – what does e-publication mean for you?”. Translated by Ali A. Dönmez, Yusuf Menemen and Zübeyde Uğurlu. MycoKeys 2: 37–44. doi: 10.3897/mycokeys.2.2471

Özet

Uluslararası Botanik Adlandırma Kuralları'nda yapılan değişikliklere, her altı yılda bir gerçekleştirilen ve Uluslararası Botanik Kongresi (IBC) ile beraber yapılan Adlandırma Seksiyonlarında karar verilmektedir. On sekizinci (XVIII.) Uluslararası Botanik Kongresi, Avustralya'nın Melborn şehrinde yapılmıştır. Adlandırma Seksiyonu 18-22 Temmuz 2011 tarihleri arasında toplanmış olup, kararlar 30 Temmuz'daki genel kurul toplantısında kongre tarafından kabul edilmiştir. Bu toplantıda yeni isimlerin yayınlanması ile ilgili olarak *Yasa*'da bazı önemli değişiklikler yapılmıştır. Bu değişikliklerden iki tanesi *Melborn Yasası*

basılmadan bir süre önce, 1 Ocak 2012 tarihinden itibaren geçerli olacaktır. 1- Elektronik ortamda Uluslararası Standart Seri Numarası (ISSN) ya da Uluslararası Standart Kitap Numarası (ISBN)'na sahip Taşınabilir Belge Biçiminde (PDF) çevrimiçi olarak yayınlanan elektronik materyal gerçek yayın kabul edilecektir. 2- Yeni takson isimleri için aranan Latince betim ya da diyagnoz gerekliliği, Latince veya İngilizce yazılmış betim veya diyagnoz gerekliliği şeklinde değiştirilecektir. Bunlara ek olarak, 1 Ocak 2013'ten itibaren uygulanmak üzere, mantar olarak kabul edilen organizmaların yeni isimlerinin geçerli olarak basılabilmesi için, tanınmış (MycoBank gibi) bir veri bankası tarafından verilen bir tanımlayıcının (seri numarasının) protolotta (bir ismin geçerli basımında onunla ilgili verilen her türlü bilgi) belirtilmesi gerekmektedir. Elektronik yayın ile ilgili yeni maddelerin taslak metinleri ve bunların en iyi şekilde nasıl uygulanacağı aşağıda sunulmuştur.

Uluslararası Alg, Mantar ve Bitki Adlandırma Yasası'nda yapılan bu değişikliklerin geniş kitlelere duyurulmasını sağlamak amacıyla bu makale BMC Evolutionary Biology, Botanical Journal of the Linnean Society, Brittonia, Cladistics, MycoKeys, Mycotaxon, New Phytologist, North American Fungi, Novon, Opuscula Philolichenum, PhytoKeys, Phytoneuron, Phytotaxa, Plant Diversity and Resources, Systematic Botany ve Taxon dergilerinde yayınlanacaktır.

Giriş

Avustralya'nın Melborn şehrinde 2011 yılının Temmuz ayında gerçekleştirilen XVIII. Uluslararası Botanik Kongresi'nde, yeni adı *Uluslararası Alg, Mantar ve Bitki Adlandırma Yasası* olan *Uluslararası Botanik Adlandırma Yasası*'nda 1 Ocak 2012 tarihinden itibaren yürürlüğe girecek iki önemli değişiklik yapıldı. Söz konusu değişiklikler bu *Yasa* uyarınca isim yayınlayan herkesi etkileyecektir. *Melborn Yasası*, 2012 yılının ortalarına kadar yayınlanamayacağından, özellikle elektronik yayıncılıkta gerçek yayın (Madde 29, 30 ve 31) konusu ile ilgili değişiklikleri ana hatlarıyla burada vermenin yararlı olacağını düşündük. Melborn'da kabul edilen *Yasa* ile ilgili tüm değişikliklerin özet raporu için McNeill ve ark. (2011)'na bakınız.

Editör ve yayıncıların *Yasa*'daki bu değişiklikleri en iyi şekilde uygulayabilmelerine yardımcı olmak amacıyla, gerçek yayın konusuyla ilgili Madde, Not ve Önerilerin değiştirilmiş taslak metinleri hazırlandı. Ayrıca, elektronik ortamda yeni isim yayınlamak ve tiplendirme yapmak isteyenler için, bu değişikliklerin ne anlama *geldiğini* veya *gelmediğini* ana hatlarıyla ortaya koyduk. Okuyuculara, kongre öncesinde önerilen değişikliklerin (Chapman ve diğ. 2010) yer aldığı Elektronik Yayın Özel Komitesi'nin raporunu da dikkate almalarını öneriyoruz. Çünkü o raporda *Melborn Yasası*'nda kabul edilen değişikliklerin nedenleri verilmektedir.

Madde 29, 30, 31 ve Öneri 29A, 30A ile 31A'nın yeniden düzenlenen taslak metinleri

Aşağıda, ilgili tüm Madde, Not ve Önerilerin (Örnekler olmaksızın) yeni metinleri, değişiklikler **koyu** yazılarak verilmiştir. *Melborn Yasası*'nın yazılı baskısının son şekli Aralık 2011'deki Editörler Komitesi toplantısında oluşturulacağından, bu metin geçicidir.

Madde 29

29.1. Bu Yasa'ya göre yayın, bütün halka ya da en azından botanikçilerin kullanabildiği kütüphanesi olan botanik enstitülerine (satış, değişim veya hediye yoluyla) dağıtılan basılmış metin ile gerçekleştirilir. **Yayın, ayrıca Uluslararası Standart Seri Numarası (ISSN) ya da Uluslararası Standart Kitap Numarası (ISBN)'na sahip Taşınabilir Belge Biçimindeki (PDF; ayrıca bkz. Madde 29.3 ve Öneri 29A.1) materyalin, çevrimiçi yayında elektronik olarak dağıtılmasıyla da gerçekleştirilebilir.** Yeni isimlerin genel bir toplantıda sunulması, halka açık bahçe veya koleksiyonlarda sergilenmesi, taslak metinden hazırlanmış mikrofilm, daktilo yazımları, herhangi bir şekilde hazırlanmış ama basılmamış materyal ya da yukarıda tanımlanmış elektronik dağıtımdan başka bir şekilde yapılan elektronik dağıtımla yayın gerçekleştirilmez.

29.2. Bu maddede yer alan "çevrimiçi" kelimesi, Dünya Ölçeğinde Ağ (www) üzerinden elektronik olarak erişilebilir olmayı ifade eder.

29.3. Eğer Taşınabilir Belge Biçimi (PDF)'nin yerine bir başkası başarılı bir şekilde yerleşirse, o zaman Genel Komite (bkz. Bölüm III) tarafından uygun bulunacak bu biçim uluslararası standart biçimi olarak kabul edilebilir.

29.4. Bir elektronik yayın çıktıktan sonra, bu yayında değişiklik yapılmamalıdır. Yapılacak herhangi bir değişiklik, kendi başına gerçek olarak yayınlanmış olmaz. Düzeltme ya da düzenlemelerin ayrı olarak gerçek bir yayın olarak çıkması gerekir.

Öneri 29A

[*Viyana Yasası*'ndaki ilgili Öneriler, aşağıdaki gibi değiştirilmiştir:]

29A.1. Taşınabilir Belge Biçiminde (PDF) elektronik olarak yapılan yayın, PDF/A arşivleme standartlarıyla uyumlu olmalıdır (ISO 19005).

29A.2. Yazarlar arşivlenen ve olabildiğince kullanışlı olan aşağıdaki ölçütlere uygun yerlerde yayın yapmalıdırlar (ayrıca bkz. Öneri 29A.1):

(a) Materyal, birden fazla güvenilir (örneğin ISO-sertifikalı) çevrimiçi dijital veri bankasına konuyorum olmalıdır;

(b) Dijital veri bankaları dünyanın farklı yerlerinde, mümkünse farklı kıtalarında olmalıdır;

(c) Ayrıca dünyanın farklı yerlerindeki, tercihen farklı kıtalardaki kütüphanelerde basılı kopyalarının depolanıyor olması önerilir.

Madde 30

30.1. 1 Ocak 2012 tarihinden önce materyalin elektronik ortamda dağıtılmasıyla yapılan yayınlar gerçek yayın olmaz.

30.2. Bir elektronik yayın, onun sadece geçici bir yayın olduğu veya olacağı, yayıncı tarafından son hali olarak karar verilen bir metinle değiştirileceğine dair yayının içinde ya da yayınlı beraber verilen bir kanıt olduğunda, gerçek olarak basılmış olmaz. Bu durumda yayının yalnızca son hali gerçek olarak basılmıştır.

30.3. Silinmez el yazısı ile 1 Ocak 1953'ten önce yapılan yayınlar gerçek yayındır. Sonraki tarihte hazırlanan silinmez el yazısı yayınlar gerçek olarak basılmamıştır.

30.4. Bu Madde gereğince, silinmez el yazısı materyal, bazı mekanik veya grafik işlemleri (örneğin taş baskı, ofset baskı veya asitle metal üzerine yazma metodu) sonucu çoğaltılmış olan el yazısı materyaldir.

30.5. Ticari kataloglarda veya bilimsel olmayan gazetelerdeki 1 Ocak 1953 ve sonrası ile tohum değişim listelerindeki 1 Ocak 1973 ve sonrası yayınlar gerçek yayın sayılmazlar.

30.6. Kurutulmuş materyal (exsiccatae) ile birlikte basılı materyalin 1 Ocak 1953 ve sonrasında dağıtımı, gerçek yayın oluşumunu sağlamaz.

Not 1. Eğer basılı metin ayrıca kuru materyalden bağımsız olarak ta dağıtılsa, gerçek yayın olarak basılmış olur.

30.7. 1 Ocak 1953 ve sonrasında, bir ünvan almak amacıyla bir üniversite veya bir eğitim enstitüsüne tez olarak sunulmuş bağımsız ve düzenli aralıklarla yayınlanmayan bir yayın, yazarı ya da yayıncısı tarafından onun gerçek bir yayın olarak kabul edildiğinin açık bir ifadesi (*Yasa'nın* gerçek bir yayın için gerekli koşullarına işaret eden) veya diğer içsel bir kanıt olmadıkça gerçek bir yayın olarak basılmış değildir.

Not 2. Orijinal baskıda Uluslararası Standart Kitap Numarası (ISBN)'nin veya basımevi, yayıncı veya dağıtımçı isimlerinin varlığı, bu yayının gerçek bir yayın olması amaçlı bir çalışma olduğunun içsel bir kanıtı olarak değerlendirilir.

Öneri 30A

30A.1. Aynı elektronik yayının geçici ve son halinin gerçekte ne zaman ilk olarak yayımlandığının açıkça belirtilmesi gerekir.

30A.2. Yazarların yeni isimleri ve yeni taksonların (adlandırma yenilikleri) betim veya diyagnozlarını ömrü kısa olan yayınların her çeşidinde, özellikle de metnin sürekliliğinin sınırlanabileceği ve bu nedenle de gerçek bir yayın için kopya sayısının belirgin olmadığı veya halka ulaşmasının mümkün olmadığı çok az ve belirsiz sayıda çoğaltılarak basılan materyallerde yayınlamamaları ısrarla önerilir. Ayrıca yazarların yeni isim, betim veya diyagnozları popüler dergilerde, özet dergilerinde veya düzeltme sayfalarında yayınlamaktan sakınmaları gerekir.

30A.3. Her yerde ve her zaman bulunabilir olmasına yardımcı olmak amacıyla, adlandırma yenilikleri yayınlayan yazarlar, düzenli olarak taksonomik makale

yayınlayan dergileri tercih etmelidir. Eğer yayın yaptığı yer böyle bir dergi değilse, **yayının bir kopyası (basılı ya da elektronik materyal) söz konusu taksonomik grubun kayıtlarını tutan bir merkeze gönderilmelidir. Sadece basılı materyal olarak varlığını devam ettiren yayınların** dünyanın farklı yerlerindeki en az on, tercihen daha fazla sayıda botanik ya da genel kullanıma açık diğer kütüphanelerde tutulması gerekir.

30A.4. Yazarlar ve editörlerin özetle adlandırma yeniliklerinden bahsetmeleri veya bu yenilikleri yayında bir indekste listelemeleri tavsiye edilir.

Madde 31

31.1. Bir gerçek yayının tarihi Madde 29 ve 30'da tanımlandığı gibi basılmış **ya da elektronik** metnin kullanılabilir olduğu tarihtir. Başka bir tarihin kabul edilmesi için kanıt olmadığında, basılı **ya da elektronik** metinde görünen tarih doğru olarak kabul edilmelidir.

[*Viyana Yasası*'ndaki Not 1, aşağıdaki gibi değiştirilmiştir:]

31.2. **Yayının elektronik ve basılı halleri birlikte gerçekleştirildiğinde, bu iki ayrı yayın şeklinin tarihleri Madde 31.1'e göre farklı olmadığı sürece, aynı tarihte gerçek olarak basılmış kabul edilirler.**

31.3. Satışa konan süreli yayın veya diğer çalışmaların ayrı sayıları önceden yayınlanırsa, bu parça üzerindeki tarih, bunun yanlışlıkla yapıldığına ilişkin bir kanıt olmadıkça, gerçek yayın tarihi olarak kabul edilir.

Öneri 31A

31A.1. Yayıncı veya ilgili dağıtım şirketinin basılmış metni, dağıtmak üzere normal taşıyıcılara teslim ettiği tarih, onun gerçek yayın tarihi olarak kabul edilmelidir.

En iyi şekilde uygulanması

Yeni isim içeren yayınların *Melborn Yasası*'na uygun olması için, tüm yeni isim yazarlarının, editörlerin ve yayıncıların gerekli ilgiyi göstermesi gerekir. Böylece yayınlanan isimler gerçek bir yayında basılmış olacaktır. Çevrimiçi baskıları olan dergi, monograf serisi ve kitaplarda yayın yapacak olanlara, bu kuralların toplumda hızla yerleşmesinde etkili olacağı düşüncesiyle, editörlerle iletişim halinde olmalarını öneriyoruz. Birçok yayıncı bilimsel yeniliklerin olduğu e-yayını basarken dikkatli davranmaktadır (bkz. Knapp and Wright 2010; PLoSOne [<http://www.plosone.org/static/policies.action#taxon>] yönergesi). Önemli uygulamaları içeren *Yasadaki* bu değişikliklerin yapılmasına olan gereksinim zaman içinde açık bir şekilde ortaya çıkmıştır.

Melborn Yasası'na uygun adlandırma yeniliği içeren e-yayınların başlangıç aşamasında, faydalı olacağını düşündüğümüz bazı uygulamalar aşağıda sunulmuştur:

- Her makalenin yayın tarihini (*New Phytologist* ya da *Nature* dergisi gibi çok sayıdaki dergide olduğu gibi) belirgin bir biçimde üzerinde taşıması gerekir.
- Eğer erken çıkan çevrimiçi baskı son baskısından farklı ise (bu haliyle gerçek yayın değildir) bu durumun belirgin biçimde her makalede belirtilmesi gerekir (örn. *American Journal of Botany*).
- Her makalede ilgili yayının ISSN ya da ISBN numaralarının göze çarpar şekilde belirgin basılması, gerçek yayınların kataloğunu hazırlayanlara yardımcı olacaktır.
- CLOCKSS sisteminde (betim için bkz. Knapp and Wright 2010) ya da diğer uluslararası arşivleme ve koruma sistemlerinde yer alan dergilerde (ya da monograf serilerinde) yapılan yayın, uzun süreli arşivlemeyi güvenceye alacaktır.
- Öneri 30A.3.'de tavsiye edildiği gibi, elektronik olarak yayın yapan yeni isim yazarlarının uygun kayıt merkezlerini bilgilendirmeleri gerekir; bu durum elektronik olarak yayınlanan ismin farkında olmayan kayıt personeline yardımcı olacaktır.

Bu değişiklikler hangi anlama gelmez

Yasa'daki yeni Madde ve Önerilerde PDF ve PDF/A terimleri kullanılsa da, bu yayınların geçerli olabilmesi için *sadece* bu biçimde yayınlanması zorunludur anlamına gelmez. Örneğin, bazı çevrimiçi dergiler makaleleri PDF biçimiyle birlikte HTML (Bağlantılı Metin İşaretleme Dili) biçiminde de yayınlamaktadırlar. Bu gibi durumlarda PDF biçimindeki baskı gerçek yayın olarak yayınlanmıştır. Taşınabilir Belge Biçiminden daha başarılı bir başka biçimin olması durumunda, Genel Komitenin uygun bulacağı yeni bir uluslararası standart biçimini kabul edebilecek olması, yeni isim yazarlarının ve bu *Yasa*'yı uygulayan toplumun yeni ilerlemeler karşısında gelişmelerden haberdar edileceği ve *Yasa*'nın çağın gerisinde bırakılmayacağı anlamına gelir.

- Aşağıda belirtilen şekillerde yapılan elektronik adlandırma yayınları, *Melborn Yasası* uyarınca, gerçek yayın olarak *sayılmazlar*.
- Yayının ağ sitelerinde (bilgisunar-website) ya da internet aracılığıyla ulaşılabilen kısa süreli metinlerde yer alması (ISSN'nin alınabilmesi için sıkı kurallar bulunmaktadır [<http://www.issn.org/>]).
- Yayının ISSN ya da e-ISSN'e kayıtlı olmayan dergilerde yer alması.
- Yayının ISBN yada e-ISBN'e kayıtlı olmayan kitaplarda yer alması.

Onaylanan yeni Öneri, e-yayına ait basılı bir kopyanın (ayrı baskının) botanikçilerin kullandığı bir kütüphanede bulunmasını tavsiye etmektedir, ancak bu konuda kütüphanecilerin uyması gereken standart bir uygulama ya da protokol getirmez. Kütüphanecilerin kendileri de farklı yayın yöntemleri arasında karmaşık geçiş kuşağında yer almaktadır (Johnson and Luther 2007). Botanikçiler, kütüphanecileri belli bir büyüklüğe sahip eserlerin saklanmasında başarılı, ancak ayrı tek baskıları saklama konusunda isteksiz ya da başarısız bulabilirler.

İsim yayınlamaya ilişkin *Yasa*'da yer alan diğer iki önemli değişiklik

Melborn'da kabul edilen ve 1 Ocak 2012 tarihinden itibaren geçerli olacak olan *Yasa*'daki ikinci değişiklik, bu *Yasa* kapsamında değerlendirilen tüm organizmaların yeni takson isimlerinin geçerli yayınlanabilmesi için gerekli betim veya diyagnozun İngilizce ya da Latince olabileceğidir. Bu koşul bitki fosilleri için şu anda uygulanmaktadır, ancak fosil olmayan tüm yeni taksonlar için betim veya diyagnozun Latince olması gerekmektedir (mantar ve bitkiler için 1 Ocak 1935'den beri; algler [eğer bu *Yasa* kapsamında değerlendirilirse siyanobakterler dahil] için 1 Ocak 1958'den beri). Bu değişikliklerin bilimsel isimlerin oluşturulmasına bir etkisi yoktur, bundan sonra da isimler Latince olmaya ve Latince dilbilgisi yapısına göre oluşturulmaya devam edecektir. Betim ve diyagnozların sadece Latince veya İngilizce olması ya da ikisinin de kabul edilmesi elbette dergilerin editörleri tarafından tercih edilecektir.

Melborn'da kabul edilen ve 1 Ocak 2013'ten sonra (Miller ve ark. 2011'de belirtildiği üzere 1 Ocak 2012 tarihinde değil) geçerli olacak *Yasada* isimlerin yayınlanmasına ilişkin yapılan üçüncü değişiklik, mantar olarak kabul edilen organizmaların yeni isimlerinin geçerli olarak basılabilmesi için, tanınmış (MycoBank gibi [<http://www.mycobank.org/>]) bir veri bankası tarafından verilen bir tanımlayıcının (seri numarasının) protolojta (bir ismin geçerli basımında onunla ilgili verilen her türlü bilgi) belirtilmesi-nin gerekliliğidir. Yeni mantar isimleri için kayıt yaptırma gereklilikleri başka bir yerde ayrıca yayınlanacaktır.

Yeni mantar isimleri için 1 Ocak 2013 ve sonrasında geçerli olacak belli bir tanımlayıcıya olan gereklilik, bitki ya da alglere *uygulanmayacaktır*. Bu gruplardaki yeni isim yazarlarının kayıt merkezlerinden Yaşam Bilimi Tanıtıcı İsmi (LSID) ya da başka bir tanıtıcı isim almasına gerek yoktur.

Teşekkür

SK'ın XVIII. IBC Melbourne, Adlandırma Seksiyonu çalışmasına katılımı NSF'nin Planetary Biodiversity Inventory programından (DEB-0316614, 'PBI Solanum - a worldwidetreatment'). JMcN ve NJT'in katılımları ise kısmen International Association for Plant Taxonomy (IAPT) tarafından desteklenmiştir. Katherine Challis (Kew)'e yararlı yorumları için teşekkür ederiz.

Uluslararası Alg, Mantar ve Bitki Adlandırma Yasası'nda yapılan bu değişikliklerin geniş kitlelere duyurulmasını sağlamak amacıyla bu makale *BMC Evolutionary Biology*, *Botanical Journal of the Linnean Society*, *Brittonia*, *Cladistics*, *MycoKeys*, *Mycotaxon*, *New Phytologist*, *North American Fungi*, *Novon*, *Opuscula Philolichenum*, *PhytoKeys*, *Phytonuron*, *Phytotaxa*, *Plant Diversity and Resources*, *Systematic Botany* ve *Taxon* dergilerinde yayınlanacaktır.

Çevirmenlerin notu: *Uluslararası Botanik Adlandırma Yasası* (Viyana Yasası) Türkçe'ye Menemen ve Dönmez (2007) tarafından çevrilmiştir.

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Translation into Arabic of: “Changes to publication requirements made at the XVIII International Botanical Congress in Melbourne – what does e-publication mean for you?”. Translated by Ahmed M. Abdel-Azeem and Gihan S. Soliman

تغييرات شروط النشر التي اجريت في المؤتمر الدولي الثامن عشر للنبات في ملبورن- ماذا يعنى النشر الإلكتروني بالنسبة لك؟

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Received 4 December 2011 | Accepted 6 December 2011 | Published 5 March 2012

Citation: Knapp S, McNeill J, Turland NJ (2010) Translation into Arabic of: “Changes to publication requirements made at the XVIII International Botanical Congress in Melbourne – what does e-publication mean for you?”. Translated by Ahmed M. Abdel-Azeem and Gihan S. Soliman. Mycokeys 2: 45–50. doi: 10.3897/mycokeys.2.2499

المخلص

يتم تقرير تغييرات في القانون الدولي للتسمية النباتية كل 6 سنوات في أقسام التسميات المرتبطة بالمؤتمرات النباتية الدولية (IBC). وبالمؤتمر الدولي الثامن عشر للنبات الذي عقد في ملبورن، استراليا؛ عقد قسم التسميات إجتماعاً خلال الفترة من 18 إلى 22 يوليو 2011 وتم قبول قراراتها من قبل المؤتمر في جلسته العامة يوم 30 يوليو. وقد أجريت نتيجة لهذا الاجتماع العديد من التغييرات الهامة على القانون والتي سيكون لها تأثير على نشر أسماء جديدة. وسيجري العمل باتنين من تلك التغييرات في I كانون الثاني 2012، وقبل بضعة أشهر من نشر قانون ملبورن. فستصبح المواد الإلكترونية التي نشرت على الانترنت على هيئة تنسيق المستندات المحمولة (PDF) مع الرقم التسلسلي المعيارى الدولي (ISSN) أو الرقم المعيارى الدولي للكتاب (ISBN) صالحة للنشر كما سيتم تغيير شرط الحصول على وصف أو تشخيص لاتينى لأسماء الأصنوفات الجديدة إلى شرط الوصف أو التشخيص سواء باللاتينية أو الإنجليزية. بالإضافة إلى ذلك، فإنه بدء من يناير عام 2013 سيكون على الأسماء الجديدة للكانتات الحية التي تعامل كقطرات

أن تشمل في البروتولوج (كل ما يرتبط بإسمه وينشره الصحيح) توثيق المعرف صادرا من مستودع معترف به (مثل بنك الفطريات MycoBank) لتصيرصالحة للنشر. ويتم توفير مسودة المواد الجديدة التي تتعامل مع النشر الإلكتروني وتحديد أفضل الممارسات. ولتشجيع نشر التغييرات التي أدخلت على القانون الدولي للتسمية للطحالب والفطريات، والنباتات، سيتم نشر هذه المقالة في المجالات التالية، *BMC Evolutionary Biology, Botanical Journal of the Linnean Society, Brittonia, Cladistics, MycoKeys, Mycotaxon, New Phytologist, North American Fungi, Novon, Opuscula Philolichenum, Taxon و PhytoKeys, Phytoneuron, Phytotaxa, Plant Diversity and Resources, Systematic Botany*.

المقدمة

في المؤتمر الثامن عشر الدولي للنبات في ملبورن، استراليا، في يوليو 2011، تم إعداد تغييرين هامين في القانون الدولي لتسمية النبات (الآن القانون الدولي لتسمية الطحالب والفطريات والنباتات) وسيكونا ساريان بدءا من 1 يناير 2012 بما سيؤثر على كل من ينشر أسماء تحت حكم هذا القانون. وحيث أن قانون ملبورن سوف لا ينشر حتى منتصف عام 2012 تقريبا، فقد شعرنا أنه سيكون من المفيد توضيح هذه التغييرات، ولا سيما بصلاحيته النشر في وسائل الإعلام الإلكترونية (في المواد 29 و 30 و 31). للاطلاع على تقرير موجز عن كل التغييرات على القانون والمقبولة في ملبورن، انظر ماكنيل وآخرون (2011).

وتم توفير مسودة لصيغة المواد المعدلة والملاحظات والتوصيات المتعلقة بصلاحيته النشر لمساعدة المحررين والناشرين لوضع أفضل الممارسات لتنفيذ هذا الجانب من القانون. ونحن نستعرض هنا أيضا ما لا تعنيه تلك التغييرات، من أجل توجيه الراغبين في نشر أسماء جديدة ونماذج بالوسائل الإلكترونية. ونحن نحث القراء على الاطلاع على تقرير اللجنة الخاصة المعنية بالنشر الإلكتروني المصاحبة للتغييرات المقترحة قبل المؤتمر (تشابمان وآخرون 2010)، حيث تم عرض منطق التغييرات التي تم قبولها في القانون الآن.

مسودة صياغة المواد المعدلة 29، 30، و 31 والتوصيات 29A، 30A، و 31A

نحن هنا نعيد صياغة كلمات جميع المواد المتصلة والملاحظات والتوصيات (مع حذف الأمثلة)، مع التأكيد على التغييرات بكتابتها بخط سميك والصياغة هنا مؤقتة لحين اجتماع لجنة التحرير في ديسمبر 2011 لوضع المسات الأخيرة على النسخة المطبوعة من قانون ملبورن.

المادة 29

29.1. النشر يصبح صالحا، بموجب هذا القانون، من خلال توزيع المواد المطبوعة (من خلال البيع والتبادل أو الهبة) لعامة الناس أو على الأقل للمؤسسات النباتية ذات المكتبات والتي في متناول علماء النبات عموما. والنشر يعد صالحاً أيضا بتوزيع المواد إلكترونيا بتنسيق المستندات المحمولة (PDF)، وانظر أيضا المادة 29.3 والتوصية 29A.1 في منشور على الانترنت مع الرقم التسلسلي المعياري الدولي (ISSN) أو الرقم المعياري الدولي للكتاب (ISBN). لا يعد النشر صالحاً بنشر أسماء جديدة من خلال تبليغها في جلسة علنية أو عن طريق وضع الأسماء في مجموعات أو حدائق مفتوحة للجمهور أو من خلال إصدار الميكروفيلم المصنوع من مخطوطات، أوراق مطبوعة، أو مواد أخرى غير منشورة، أو عن طريق التوزيع الإلكتروني غير المذكور أعلاه. 29.2. لغرض هذا المقال يعرف «الإلكتروني» بأنه ما يمكن الوصول إليه إلكترونيا عبر الشبكة العنكبوتية العالمية. 29.3. في حال استبدال نسق المستندات المحمولة (PDF)، فيقبل خلفا له تنسيق المعايير الدولية التي تحددها اللجنة العامة (انظر الجزء الثالث).

29.4. يجب عدم تغيير أي محتوى خاص إلكتروني بعد صدوره لأول مرة وأي تعديل من هذا القبيل يعتبر مغايراً للنشر الصالح ذاته وأي تصحيحات أو تعديلات يجب أن تنشر منفصلة لتعتبر منشورة نشرأ صالحاً.

توصية 29A

- [التوصية الحالية يستعاض عنها بما يلي :]
- 29A.1. ينبغي أن يكون النشر الإلكتروني في نسق المستندات المحمولة (PDF) متوافقاً مع نسق المستندات المحمولة/ المحفوظات القياسية (ايزو 19005).
- 29A.2. يفضل أن يقوم الناشر بالنشر في المنشورات التي يتم حفظها، وتلبي المعايير التالية بقدر إمكانية التطبيق (انظر أيضاً التوصية 1 A. 29) :
- (a) ينبغي أن توضع المواد في مستودعات رقمية عديدة بالانترنت موثوق بها ، مثل مستودع حائزة على شهادة الأيزو؛
- (b) ينبغي أن تكون المستودعات الرقمية في أكثر من منطقة واحدة في العالم ، ويفضل أن تكون في مختلف القارات؛
- (c) تخزن النسخ المطبوعة في المكتبات في أكثر من منطقة واحدة من العالم ، ويفضل أيضاً في قارات مختلفة.

المادة 30

- 30.1. لا يشكل المنشور الإلكتروني منشوراً صالحاً قبل 1 يناير 2012.
- 30.2. لا يعد المنشور الإلكتروني منشوراً صالحاً إذا كانت هناك أدلة مرتبطة بالمنشور أو داخله على أنه مجرد نسخة أولية كانت ستستبدل أو سيتم استبدالها بنسخة يعتبرها الناشر نهائية وفي تلك الحالة تكون النسخة النهائية تلك فقط هي الصالحة للنشر.
- 30.3. يعتبر النشر عن طريق مخطوطات لاتمحي قبل 1 يناير 1953 نشراً صالحاً. أما المخطوطات التي لا تمحي والتي أنتجت في وقت لاحق لا تعد نشراً صالحاً.
- 30.4. هدف هذه المادة، ان المخطوطة التي لاتمحي عبارة عن مادة مكتوبة بخط اليد وتم انتاجها عن طريق عملية ميكانيكية أو طباعة (مثل الطباعة الحجرية ، الاوفست، أو النقش معدني).
- 30.5. النشر في أو بعد 1 يناير 1953 في كتالوجات التجارة أو الصحف غير العلمية، وفي أو بعد 1 يناير 1973 في قوائم تبادل البذور ، لا يشكل نشراً صالحاً.
- 30.6. توزيع المطبوعات في أو بعد 1 يناير 1953 المصاحبة للعينات لا يشكل نشر صالحاً.
- ملاحظة 1. أما إن تم توزيع المادة المطبوعة مستقلة عن العينات، يعد النشر صالحاً.
- 30.7. النشر في أو بعد 1 يناير 1953 لعمل مستقل بدون رقم مسلسل على أنها أطروحة قدمت إلى جامعة أو معهد تعليمي آخر بغرض الحصول على درجة لا يعد نشراً صالحاً ما لم يتضمن بياناً واضحاً (في إشارة إلى شروط قانون النشر الصالح) أو أدلة داخلية أخرى على أنها تعتبر نشراً صالحاً من قبل مؤلفها أو ناشرها.
- ملاحظة 2. ويعتبر وجود الرقم المعياري الدولي للكتاب (ISBN) أو بياناً باسم المطبعة، أو الناشر أو الموزع في النسخة الأصلية المطبوعة دليلاً داخلياً أن العمل كان مخصصاً للنشر نشراً صالحاً.

توصية 30A

- 30 A. 1. ينبغي الإشارة بوضوح إلى أن الإصدار الأولي والنهائية لذات النشر الإلكتروني كانتا كذلك عند إصدارهما للمرة الأولى.
- 30A.2. ينصح وبشدة أن يتجنب المؤلفين نشر أسماء وأوصاف جديدة أو تشخيص لأصنوفات جديدة (تسميات حديثة) في أي مطبوعات سريعة الزوال من أي نوع ، ولا سيما المواد المطبوعة التي أنتجت في أعداد محدودة وغير مؤكدة ، والتي عندها تكون ديمومة النص محدودة ، وبالتالي فإن النشر الصالح بالرجوع إلى عدد النسخ يصبح غير واضح ، أو أنه من غير المرجح أن يصل إلى عامة الناس. وينبغي أيضاً أن يتجنب المؤلفين نشر أسماء وأوصاف جديدة أو تشخيصات في الدوريات الشعبية، في مجلات للملخصات، أو على قصاصات تصويب.
- 30A.3. ولتسهيل الإتاحة عبر الزمان والمكان ، يجب على المؤلفين ممن يقوموا بنشر أسماء جديدة إعطاء

الأفضلية للدوريات التي تنشر المقالات التصنيفية بانتظام. و إلا فعليهم إرسال نسخة من المنشور (سواء كان منشورا مطبوعا أو إلكترونيا) إلى مركزا للفهرسة مناسباً للمجموعة التصنيفية ، أما المنشورات التي لا توجد إلا على هيئة مطبوعة فينبغي إيداعها في بما لا يقل عن عشرة ، ولكن يفضل أكثر ، مكاتب نباتية أو غيرها من المكاتب المتاحة عموما في جميع أنحاء العالم.

30A.4. وينصح أن يقوم الكتاب والمحررين بذكر الأسماء الجديدة في الملخصات والمختصرات، أو حصرها في فهرس في المطبوعة.

المادة 31

31.1. تاريخ النشر الصالح هو التاريخ الذي تصبح فيه المادة المطبوعة أو الإلكترونية متاحة كما تم تعريفها في المادة 29 و 30. في غياب بروفة طباعة لإثبات تاريخ آخر ، فإنه يجب قبول التاريخ الظاهر على المواد المطبوعة أو الإلكترونية على أنه صحيحا.

[ملاحظة 1 القائمة يستعاض عنها بما يلي:]

31.2. عندما يتم إصدار منشور إصداراً إلكترونيا ومطبوعا بالتوازي فيجب معاملة كلاهما كنشرا صالحا في ذات التاريخ ما لم يكن تاريخ الإصدار مختلفا طبقاً للمادة 31.1.

31.3. عندما تطرح بعض المسائل من دوريات أو من أعمال أخرى للبيع مقدما ، فإن التاريخ الموجود على المسئلة يقبل على أنه تاريخ النشر الصالح ما لم يتوفر دليل على خطأ ذلك.

توصية 31A

31A.1. ينبغي قبول التاريخ الذي قام فيه الناشر أو وكيل الناشر بتوفير المواد المطبوعة إلى واحدة من شركات الطيران المعتادة للتوزيع على الجمهور على أنه تاريخ النشر الصالح.

أفضل الممارسات

على مؤلفي الأسماء الجديدة ، والمحررين والناشرين جميعا الاهتمام بالتأكد أن المنشورات والتي تشمل على أسماء جديدة توافق جميعها قانون ملبورن ، بحيث يتم نشر الأسماء فيه بشكل صالح. ونقترح أن من يقومون بالنشر في المجلات أو سلسلة من الدراسات والكتب التي لها طبعات على الإنترنت التواصل مع المحررين بحيث يمكن التوصل لأفضل الممارسات في جميع أنحاء المجتمع بأسرع وقت ممكن. وقد قام العديد من الناشرين بتناول المسائل التي تتصل بالنشر الإلكتروني للمستجدات لبعض الوقت (انظر ناب ورايت ٢٠١٠ ؛ المبادئ التوجيهية PLoS One [http://www.plosone.org/static/policies.action#taxon] وقد بدأ منهم اهتماما واضحا بسرير التغييرات الجديدة في القانون بفاعلية.

ومن الممارسات التي نراى أنها ستساعد في المراحل الأولية للنشر الإلكتروني للمستجدات وفقا لقانون ملبورن هي :

- أن يحمل كل مقال تاريخ نشره بصورة واضحة (كما هو الحال في العديد من المجلات ، على سبيل المثال *New Phytologist* أو *Nature*).
- إذا تم إصدار نسخة على الإنترنت في وقت سابق ليست هي نفس الصيغة النهائية (وبالتالي لا يعد هذا مكان النشر الصالح) ، يختم كل مقال بهذه الحقيقة بوضوح (على سبيل المثال *American Journal of Botany*).
- عرض الرقم التسلسلي المعياري الدولي أو الرقم المعياري الدولي للكتاب المنشور بوضوح على كل مادة لتساعد

المفهرسين لإنشاء نشر صالح.

- النشر في مجلات (أو سلسلة من الدراسات) تشارك في نظام CLOCKSS (انظر ناب ورايت 2010 للحصول على وصف) أو أرشيف دولي آخر ونظام حفظ يضمن الحفظ على المدى الطويل.
- وينبغي أن ينيه المؤلفين للأسماء الجديدة بالوسائل الإلكترونية مركز الفهرسة المناسب لهم على النحو الموصى به في التوصية A.3.30 - مما سيساعد المفهرسين الذين قد لا يكونوا على وعي بالأسماء المنشورة إلكترونياً أن لم يتم تنبيههم بتلك الكيفية.

ما لا تعنيه هذه التغييرات

على الرغم من أن المواد الجديدة والتوصيات تستخدم مصطلحي نسق المستندات المحمولة ونسق المستندات المحمولة/ المحفوظات القياسية PDF / A و PDF ، فإن هذا لا يعني حتمية أن تصدر المنشورات حصرياً في هذا الشكل لتكون صالحة للنشر. على سبيل المثال ، بعض أوراق المجلات على الإنترنت تصدر في تنسيق لغة توصيف النص التشعبي (HTML) بالتوازي مع نسق المستندات المحمولة. وفي مثل هذه الحالات ، سيتم نشر نسخة نسق المستندات المحمولة نشرًا صالحًا. أن شرط أن اللجنة العامة للتسميات النباتية سوف تنقل قبول صيغة معيار دولي جديدة ، في حال استبدال نسق المستندات المحمولة طالما يعني أن مؤلفي الأسماء الجديدة والمجتمع ممن يستخدموا القانون يستطيعون البقاء على علم بالتقدم في المجال وأن القانون سوف يكون محمياً من التقادم.

استخدام الوسائل التالية للنشر الإلكتروني لن تؤدي للنشر الصالح للمستندات بموجب قانون مليون :
 • النشر على مواقع الإنترنت أو في وثائق زائلة متاحة عبر شبكة الإنترنت (هناك معايير صارمة لمنح الأرقام

التسلسلية المعيارية الدولية [http://www.issn.org]).

• النشر في مجلات دون رقم تسلسلي معياري دولي مسجل أو رقم تسلسلي معياري دولي إلكتروني.

• النشر في كتب دون الرقم المعياري الدولي للكتاب أو الرقم المعياري الدولي للكتاب الإلكتروني.

إن التوصية المعتمدة كمشورة لحفظ نسخة مطبوعة من أي نشر إلكتروني في مكتبة تقترح لعلماء النبات عملاً إجرائياً، إلا أنها لا تنص على ممارسة معيارية أو بروتوكول يتبعه أمناء المكتبات. فأمناء المكتبات أنفسهم في مرحلة انتقالية معقدة بين طرق النشر (جونسون ولوثر 2007) ، وقد يجد علماء النبات أن أمناء المكتبات غير راغبين أو غير قادرين على استيعاب إحدى المطبوعات الورقية كمشور مفرد في حال كونه كبير الحجم .

تغييران آخران هامان في القانون يتعلقان بنشر الأسماء

التغيير الثاني في القانون الذي تم اعتماده في مليون على أن يسري بدئه من يناير 2012 هو أن الوصف أو التشخيص المطلوب للنشر الصالح لاسم جديد لجميع الكائنات التي ينطبق عليها القانون يمكن أن تكون بالإنجليزية أو اللاتينية وهذا هو الشرط الحالي لأسماء حفريات النبات إلا أن كل الأسماء الغير حفرية الجديدة مازالت تتطلب وصفاً لاتينياً أو تشخيصاً (الفطريات والنباتات من 1 يناير 1958 والطحالب بما يشمل البكتيريا الخضراء المزرققة لو تمت معاملتها بموجب القانون من يناير 1958). وهذا لا يطبق في حالة الأسماء العلمية والتي تستمر لاتينية أو تعامل كلاتيني. والمتطلبات الفردية لمجلة باللاتيني و/ أو الإنجليزي يحددها محرري تلك المجلات.

والتغيير الثالث للقانون المعتمد في مليون يرتبط بنشر الأسماء لكنه لا يسري حتى 1 يناير 2013 (ليس يناير 2012 كما نقله ميلر وآخرون 2011) وهو أن الأسماء الجديدة للكائنات التي تعامل كفطريات يجب أن، بالإضافة إلى شرط النشر الصالح ، تشتمل في البروتولوج (كل ما يرتبط بالاسم وصلاحيته نشره) على المصدر الذي يحدد المعرف وصادر من مستودع معترف به (مثل بنك الفطريات [http://www.mycobank.org]) وينشر ذلك بشكل منفصل. إن شروط المعرف الفريد لاسم جديد من الفطريات بحلول 1 يناير 2013 أو بعد ذلك لا ينطبق على النباتات أو الطحالب ولا حاجة لمؤلفي أسماء جديدة في هذه المجموعات أن يطلبوا معرف في علوم حياة (LSIDs) أو أي معرفين آخرين من مراكز الفهرسة.

شكر وتقدير

تم دعم ساندرانا من قبل المؤسسة العلمية الوطنية برنامج رصد التنوع البيولوجي الكوكبي (منحة DEB - 0316614)، رصد التنوع البيولوجي الكوكبي لـ *Solanum* في جميع أنحاء العالم). ودعم حضور كلا من جون ماكنيل ونيكولاس ج تورلاند جزنيا في قسم التسميات للمؤتمر الدولي الثامن عشر للنبات في ملبورن من قبل الجمعية الدولية لتصنيف النبات (IAPT). نشكر كاثرين تشاليس (كيو) لتعليقاتها المفيدة لتشجيع نشر التغييرات التي أدخلت على القانون الدولي لتسمية الطحالب والفطريات ، والنباتات، سوف تنشر هذه المقالة في المجلات التالية *BMC Evolutionary Biology*, *Botanical Journal of the Linnean Society*, *Brittonia*, *Cladistics*, *MycoKeys*, *Mycotaxon*, *New Phytologist*, *North American Fungi*, *Novon*, *Opuscula Philolichenum*, *PhytoKeys*, *Taxon* و *Phytoneuron*, *Phytotaxa*, *Plant Diversity and Resources*, *Systematic Botany*

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